



FRIDAY, JULY 20, 1877.

## Improved Injectors by William Sellers &amp; Co.

The engravings herewith represent the latest improved form of injectors manufactured by this firm, and described as follows in a small treatise on these instruments which has recently been issued by the manufacturers and from which we have been permitted to make extracts:

The [original] Giffard injector was an adjustable nozzle injector—adjustable in both the water and steam supply within the instrument itself. With this instrument any change in

makes a corresponding change in the water-flow to the combining tube, and as a result the steam is always combined with the exact quantity of water necessary to produce the best result, with neither waste nor indraught of air. This instrument, the self-adjusting injector, since its first introduction in 1865, has from time to time been improved until the new style, the "Injector of 1876," figs. 1 and 2, was produced. This form of the instrument was designed with especial reference to its use on locomotives, but it has proved to be so much more convenient for all purposes that it is now recommended in preference to any other style of injectors. The description of it will explain the fundamental principles of all our previous types of this instrument so far as the self-adjustment is concerned; the new injector, however, has embodied in it a device for starting which does away with the expensive valves and fittings required with our old self-adjusting injectors. Added to this, it is operated by a simple lever-motion which starts, stops or regulates its quantity of delivery with a readiness and accuracy never before attained. The annexed sectional cut, fig. 2, and exterior view, fig. 1, show the instrument in its improved form.

The outer shell, or case, consists of two parts, united by

and, raising the check-valve at the end of the instrument, passes into the boiler.

If now the water supply is, or becomes, too great, a portion of the water escapes by the opening *O* in the upper part of the delivery tube, and, accumulating in the surrounding chamber, forces back the piston *N N*, which of course carries with it the combining tube, thus diminishing the annular space through which the water enters the combining tube, and so limits its supply. If, on the other hand, there be not sufficient water admitted, the velocity of the steam jet will be increased, and a partial vacuum will be produced in the chamber, and the piston *N N* will consequently be brought forward, thus opening the space for water supply and correcting the defect.

The instrument is, therefore, self-regulating. It will at all times adapt itself to the changed conditions of pressure, and will always develop a maximum result proportioned to the steam used.

It has been observed that the conical spindle which regulates the flow of steam in the receiving tube *A* is perforated by a narrow passage bored along its axis, which communicates with the steam space above valve *X* when valve *W* is raised. The small jet of steam which escapes through this hole before the

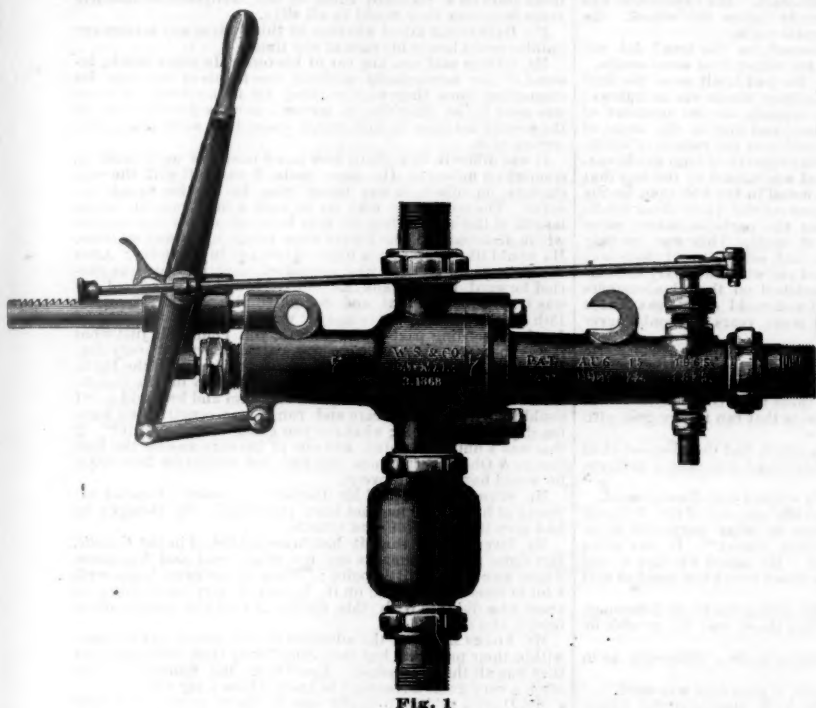


Fig. 1.

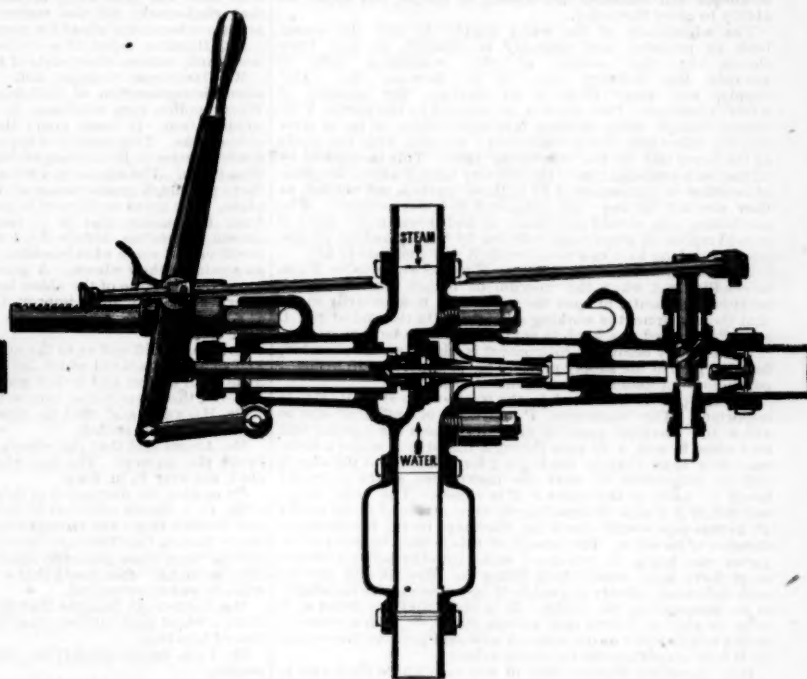


Fig. 2.

steam supply required a corresponding change in the water supply, and if the proper relation between these parts was not maintained there was either a waste of water from the overflow or an indraught of air at this place. So that if after an adjustment of the parts to produce the best results the steam pressure of the boiler changed, the instrument would work badly until readjusted to the new condition. This led to the introduction of the self-adjusting injector, which is so arranged as to have no waste at the overflow; the steam being adjusted by hand, the instrument itself adjusts the water supply. Thus, when the injector is in operation, any change in boiler pressure

bolts, *E E*. The part *G* is provided with two inlets, the upper one for steam, the lower one for water, as shown in the cut, the two being separated by the plate *F F*, in the centre of which is screwed a nozzle, *A*, called the receiving tube, for the steam-jet. The amount of steam which may be discharged by this nozzle is regulated by the tapered plug within it. The interior of the case *M M* is bored out for a short distance, and fitted with a lining of brass, turned out to receive the piston *N N*, which plays freely along it. This piston forms the upper or receiving end of the converging pipe *C*, called the combining tube. The lower end of this tube is exteriorly cylindrical, and slides in a guide at the upper end of the delivery tube *D*, which is stationary, being screwed into the outer shell at *M M*.

Beyond this point again, a small screw-top valve, *P R*, affords, when open, a lateral outlet to the space *K* in the case *M*, and beyond this, again, a check-valve is placed, which opens towards the boilers, and closes by boiler pressure when the instrument is not working. Up to this point of our description of the instrument it corresponds with our other forms of self-adjusting injectors. The spindle in the receiving tube *A* in the ordinary self-adjusting injector is drawn back and adjusted by a screw. In this instrument it is a prolongation of a rod, *B*, passing through a stuffing box, *D*, and coupled to a cross-head. This cross-head, *I*, slides on a rod, *J*, and is operated by a lever, *H*. A prolongation of the pin which unites lever *H* to cross-head *I* is provided with an eye through which passes a rod, *L*. This rod *L* connects with a lever on the top end, *R*, of the screw waste-valve. Stops, *Q T*, are arranged on this rod in such a manner that when cross-head *I* is at one end of the stroke, as shown in the cut, and the spindle *B* is all the way in, the waste-valve *P R* will be open. As the lever is drawn back the eye comes in contact with stop *T*, and by the time it has completed its stroke will have closed the waste-valve, after which the lever can be moved back and forth between the stops *T Q* without opening the valve. A latch, *V*, with spring back of it, is arranged to remain up as the lever *H* is drawn back, until it has reached the end of its stroke, when it falls into teeth cut on the upper side of rod *J*. As the lever *H* is pushed forward the latch clicks over the various teeth until it has reached the notch which marks the minimum capacity of the injector, after which the motion of the lever forward to stop the instrument raises the latch and fastens it up as before. On the end of rod *B* is an enlargement forming a valve, *W*; this seats in the upper side of a second valve, *X*, which in turn seats on the receiving tube *A*. The tapered spindle in *A* is screwed into end *W* of rod *B*, and is perforated its entire length, and provided with grooves at the screwed end to permit steam entering when valve *W* is raised from its seat; this for reason to be hereafter explained. This instrument works to the best advantage when it is lifting water, and in no case must the water be fed to it under pressure. When it is attached to the hydrant, a regulating valve must be placed to cut off the hydrant pressure.

The cut shows the instrument with valves *W X* closed, so that no steam can enter the receiving tube *A*. By drawing back the lever *H* a short distance, or until a collar on the taper spindle beyond valve *X* comes in contact with valve *X*, steam will enter and pass down through the hole in centre of the tapered spindle, and escaping at its end will lift the water, fill the chamber, and flow out of waste-valve at *P*. As soon as water shows itself at this opening *P*, the lever may be drawn entirely back, taking with it the valve *X*, and admitting a free flow of steam through *A*, accelerating the escaping flow at *P*, then closing the waste-valve by rod *L*, lowering latch *V* into teeth of ratchet, and starting the instrument at full capacity; after which, the lever *H* being pushed in to any required point between the two stops *T Q*, the required delivery can be obtained. The action which takes place in the instrument when in operation may be briefly described as follows:

The steam passing into *C* is condensed by the water there combining with it from the water supply; the concentrated jet is then driven through the delivery tube *D* into the space *K*,

valve *X* is raised exerts a much greater lifting force to raise water from the supply into the combining tube *C* than would be produced by a jet of steam through the annular space between the taper plug and nozzle *A*.

The reason of this is, in part, as follows: To produce this lifting effect, which is quite dissimilar from that of the injector in its operation as a boiler feeder, and is more nearly allied to the action of the exhaust in producing a draft in the smoke-stack of a locomotive, it is requisite to have a free expansion and high velocity of the steam jet at the moment it escapes into the centre of the combining tube *C*, and an outlet beyond

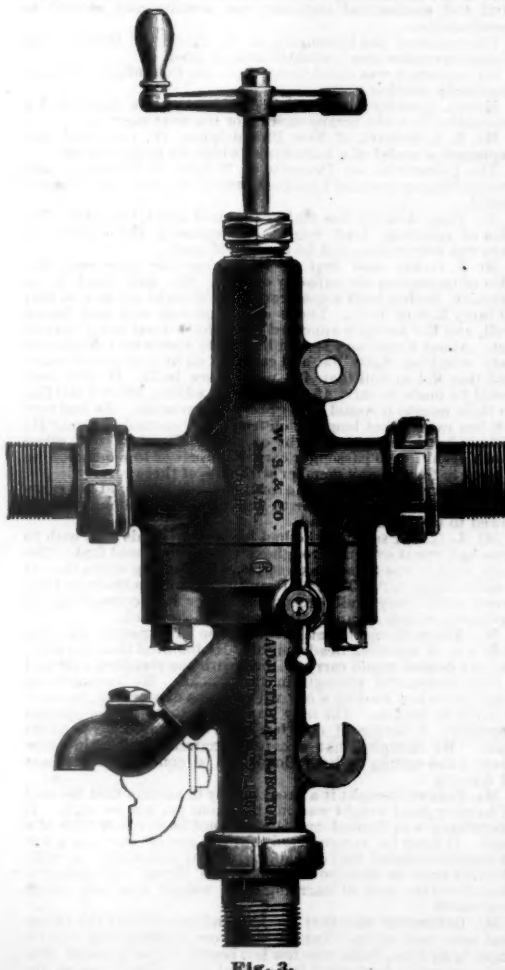


Fig. 3.

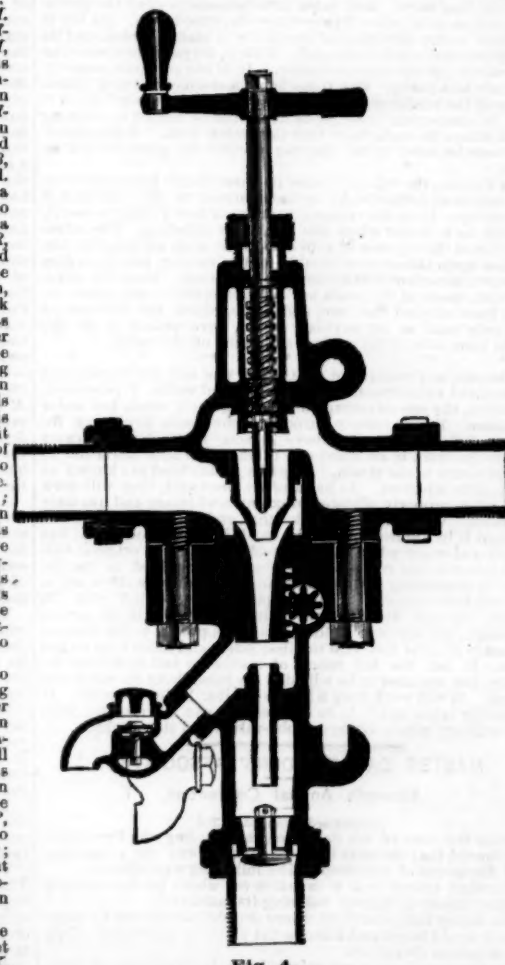


Fig. 4.



not only sufficient to allow this expanded steam to pass freely, but also to give an exit to the air carried with it by friction.

Now in all these respects the annular jet about the spindle in nozzle A is at a great disadvantage as compared with the orifice in the centre of the spindle.

Thus the friction is immensely greater in the annular jet, thereby reducing the velocity, especially if the jet is but slightly open; while, on the other hand, if more space is given in the annular jet, the amount of steam discharged will be more than can pass freely by the nozzle C, thus tending to produce a back-pressure rather than a vacuum in C and the water-supply pipe. In fact, it has been found that, in comparing the lifting power of the central jet with an annular one, the latter or annular jet, under the best conditions in the older styles of instruments, would lift water only from 2 to 6 feet, while the central jet will lift it from 10 to 18 feet, depending on the size of the instrument. In this connection it is proper to call attention to the necessity for excluding air from the water-supply pipes; any leak of this kind will not only impair the vacuum, but also, as air does not change its form, or lose its elasticity when in contact with water, its presence in the steam-jet will diminish the density of the jet, and impair its ability to enter the boiler.

The adjustment of the water supply to suit the steam both in pressure and quantity is effected, as has been shown, by the motion of the combining tube C towards the delivery tube A to decrease the water supply, and away from it to increase the amount of water admitted. This motion is effected by the piston N N, which, except when moving, is in equilibrium, so far as pressure on either side of it is concerned; so, also, with the guide at the lower end of the combining tube. This is steadied by sliding in a prolongation of the delivery tube D above the point of overflow O. Accuracy of fit in these parts is not needed, as they are not in any case subjected to boiler pressure. The combining tube should play freely up and down in the case; it is held rigidly in place when working by the operation of the jet, and so long as it can move freely it will continue to act.

The rod extending from the lever H to the waste-valve R can be readily used, when the instrument is not working at its maximum capacity, to open the waste-cock momentarily to see that the instrument is working all right. On the end of rod Z stop T is formed as a knob to enable the rod to be thus used.

Immediately below the instrument is placed an air chamber, forming part of the supply pipe. This is important to insure a continuous jet under all conditions of use.

When a pipe is connected to the waste-valve at P, its size is important. The waste-pipe P must be of sufficient size to allow the smallest quantity of water which the injector will feed when in action to pass through the pipe D under a pressure less than that in the boiler; for if this is not the case it will be impossible to start the instrument, as the jet would break as soon as the valve P R is closed. The same result will follow if a pipe of some length were attached to the outlet P, as this pipe would check the discharge by the frictional resistance of its sides. The reason of this is that before the injector can begin to introduce water into the boiler a stream must have been established, filling the pipe D, and moving with sufficient velocity to enable it to overcome the resistance of the pressure in the boiler. It is clear that the outlet at P must be able to deliver this stream freely, or such a pressure would be produced in the space K as would prevent the stream in D from acquiring the necessary velocity.

It is, therefore, evident that in any case where the waste is to be carried away by a pipe connected with P, this pipe should be large enough to avoid such resistance as has been noted. Practical experience has shown that, for a pipe of moderate length, a diameter at least twice that of the outlet P is requisite.

The new form of instrument, known as our "Injector of 1876," was especially designed for use on locomotives, and it is believed that all the requirements of a perfect boiler-feeder have been secured. The instrument can be placed in any convenient position in the "cab," regardless of its height above the level of the water in the tank, as it works best when lifting its supply of water. A simple motion of the working lever H of the instrument starts, stops or regulates the quantity of delivery with an ease and certainty never before attained. All the starting valves and extra attachments forming the necessary adjuncts of other injectors are dispensed with. Its use is reduced to the minimum of simplicity in manipulation, and its efficiency very much increased. With it, no possible excuse can be raised by the engine-runner. It is not so troublesome to operate as a pump. One remarkable feature of the new instrument is the readiness with which it will "take water" when it and its connecting water pipes have become heated by blowing back steam through them into the water tank. Little difference can be noted in the starting whether the pipes be hot or cold.

In Europe, the injector under its many forms has come to be the universal boiler-feeder in locomotives, to the exclusion of the pump. Here the runners have been less willing to use it, except as a feeder when the engine is standing. The introduction of the injector of 1876 does away with all possible objection upon the score of trouble to the runner, and gives him a more convenient boiler-feeder than a pump. Since its introduction, many of the roads not using injectors to any great extent have adopted this one, and some, where the instrument was only used as an auxiliary feeder, have placed it on the right hand side of the engines and taken off the pump.

The original instrument of Giffard was not self-regulating; it required adjustment, both for steam and water. It possessed, however, the one advantage of working well when fed under pressure. For stationary purposes some users prefer an injector of this type for the above reason, particularly in cases where the work is constant and there is but little variation in the pressure of the steam. Injectors of this kind are known as adjustable injectors. As has already been said, they will work well when properly adjusted in quantity of steam and quantity of water. We continue to make this style of instrument, and present it in Figures 3, 4, as the most improved form. It has steam-and-water adjustment, provided as in the original Giffard injector, but it has been very much simplified in its details by dispensing with packing and increasing its efficiency to lift and force water. Its steam-spindle is provided with the central passage, described above, in connection with our patent self-adjusting injector. This gives it the power to lift water a distance of eight feet with smallest sizes, and more with larger ones. It has the full range of maximum and minimum delivery, but requires to be adjusted by hand, both in water and steam. It will work from 5 lbs. to 150 lbs. boiler pressure. It is readily taken apart to be cleaned. It can be erected with any ordinary steam-fittings, globe-valves and stop-cocks.

#### MASTER CAR BUILDERS' ASSOCIATION.

##### Eleventh Annual Convention.

(Continued from page 314.)

After the close of the debate on car coupling the PRESIDENT announced that the next business in order was the presenting and discussion of questions. The following was offered:

To what extent can a cast-iron car wheel be chill-cracked without injury or without reducing its mileage?

Mr. KIRBY had seen them where the chill-crack was so large that it would break and leave a flat place on the tread. That was a serious detriment.

Mr. FORD said that some rejected wheels on account of chill-

cracks. He had heard wheel men say that a small one was no detriment; others would accept wheels with a small crack.

Mr. DAVENPORT said that it was generally recognized that the best iron for wheels was the most liable to show chill-cracks. He felt sure, from many years' experience, that a chill-crack that does not open more than a quarter of an inch will not crush down, but he would not send out such a wheel. Where the opening was not more than  $\frac{1}{8}$  or  $\frac{1}{4}$  in. he would not hesitate to use the wheel for himself. But a wheel-maker had to be very careful and could not send out such a wheel. They broke up every year for this reason a great number of wheels that would probably make a large mileage, but would be returned if they were sent out. Where a crack opened more than a quarter of an inch it would probably crumble down from both sides, and should not be used.

Mr. FORD said that he had never broken by use a wheel that was chill-cracked, but he had seen many broken up for that reason.

Mr. HOPKINS said that extended observation had convinced him that a chill-crack not more than an eighth of an inch wide should not condemn a wheel unless it extended into the flange.

Mr. ADAMS knew that wheel-makers were agreed that the best iron was most likely to chill-crack. His experience was that chill-cracks did not materially injure the wheel. He never condemned a wheel for a small crack.

Mr. HOPKINS asked if a chill-crack on the tread did not necessarily relieve other parts of the wheel from some strain.

Mr. DAVENPORT thought not. He had lately seen the first scientific explanation of chill-cracking, which was as follows: When molten iron solidifies, it expands at the moment of solidification. It tears apart then, and that is the cause of chill-cracks. This quality of expansion at the instant of solidification seems to be an inseparable property of high grade car-wheel iron. The strain on a wheel was caused by the fact that there is a much greater mass of metal in the hub than in the plate. The great problem is to prevent the plate from solidifying thoroughly, that is so that the particles cannot move among themselves, before the hub cools. This was no easy problem, but some wheel-makers had solved it and there was no strain on their wheels. A good car wheel was very difficult to make. In spite of the abuse lavished on the wheel-makers their wheels were much improved and could carry heavy loads at a speed that the wheels made some years ago could never have stood.

Mr. ADAMS differed as to the quality of the old wheels. He had some 27 years old which he kept as a curiosity; they had done good service and looked good for 100,000 miles more. He believed there was better iron in them than could be had now.

Mr. HACKETT said that the wheels that ran the longest with them had the least chill.

Mr. ADAMS said that the wheels which had the deepest chill broke the soonest. The best wheels had generally a uniform chill, not over  $\frac{1}{4}$  in. deep.

On motion the discussion of this subject was discontinued.

Mr. C. A. SMITH said that in the last number of the *National Car Builder* there was an engraving of what purported to be the "Master Car Builders' Standard Wheel." It was more conical than those generally used. He asked whether it was true, as he had often heard that a wheel would not stand so well when it was more conical.

Mr. DAVENPORT thought that the coning made no difference. With a wheel made of first-class iron there was no trouble or fear of breaking.

Mr. C. A. SMITH asked if the coning made a difference as to cooling.

Mr. DAVENPORT said that it might, if poor iron was used.

The PRESIDENT then invited Mr. A. W. Davies, of the Atlantic & Great Western, who was present, to make some remarks on his system of keeping mileage of wheels.

Mr. DAVIES then, after expressing thanks for the invitation and disclaiming any intention of forcing the introduction of the system on which he held a copyright, said that this question of individual mileage was one of the most important now under consideration. It was claimed that individual mileage could not be kept. It could be done, but a considerable expense attended it. His experience showed that it could be done if there was a unity of the railroads. Instead of recording the movement of foreign cars, let the clerical help that is now employed for that, simply transcribe the number of the car under its proper initials and the point where it comes from and the point of its destination. All the stations to be numbered and those numbers to be the number of miles from the eastern or northern terminus of the road. If you had a branch from the main line, starting at say 25 miles from the terminus, simply number the stations on that branch in the same way, designating the branch A. Suppose it starts at a point 25 miles from the eastern terminus, you say "Station 25 A"—A, because it is the first branch. To ascertain the number of miles a car has traveled, you have only to take the difference between the station numbers. If a car travels from 10 to 40, you know it has gone 30 miles. As he had said before, the clerical force now employed to register foreign cars might transcribe the number of the car on a blank, with the station from which it comes and the point to which it is going, and take an impression copy of that to keep, transmitting the record to the owner of the car. The result would be this, taking a Lake Shore car for example. This Lake Shore car travels on the New York Central from Buffalo to Albany. Suppose that halfway is a station numbered 150. The Car Accountant of the Lake Shore road has received a record of his car's arrival at Buffalo on his own line. He simply puts in red ink the letter of the company—the New York Central might be known as M on the number of that car. He receives notice that that car has traveled on M to 150, and so records it. The next day he hears that the same car has traveled to some other station, and he puts that down. Thus he fills up, in his own office, the movements of that car on the New York Central, and the record shows that it has traveled 300 miles on the New York Central, besides the mileage made on its own road.

As to the benefits accruing from this arrangement, they are threefold. First, the Master Car Builder wants the information, because he wants to know what his car wheels have done. He can get that information from the Car Accountant of his own road. If the Lake Shore road wants the mileage of one of its cars, it can be figured out in its own office; there is no need to ask the New York Central to do it.

The second benefit is to the General Superintendent. As a rule he does not want to know the mileage of wheels, but when there is a call for cars, he wants to know where his cars are. So many on the New York Central, so many on the Chicago, Burlington & Quincy. He says: "Order them in at once." A tracer is sent to the New York Central. What is the reply? "We sent it to the Boston & Albany." The Boston & Albany says: "We sent it to one of our connections." By the time you trace it where is your car? Back on your own road again. If the movements of the car were recorded every day, your accountant could jump all over the intervening roads and locate that car at once.

The third point gained is that you have a perfect check on the mileage of your cars on connecting lines, which has not yet been known by any company. Now that is a great desideratum with all auditors of roads.

Those are the three principal advantages of this system: The Master Car Builder wants to know about his wheels; the Superintendent where his cars are, and the Auditor what money is due from connections. Of course, if there is any discrepancy in amounts, the Car Accountant discovers it, just the same as if it were on his own line, and consequently, at the end of the month, you know just what your cars have done on

foreign lines; there is that much gained for the Auditor. Now this might look as if it were an immense thing to do. It is nothing more than to number your stations the number of miles they are from the terminus, and then, instead of recording the cars on the books, to transcribe on this blank, take an impression of it, and send the original to the owner of the car.

A great many roads do not care about the individual mileage—their wheels are not guaranteed—but they would like to know where their cars are, and they have that at their disposal. Another says: "We do not care about the mileage, but this car business is very important, but we guess our connections are pretty honest so far as that is concerned." But the Auditor has his doubts about that and this plan just suits him, for he has a sure thing on the mileage and location of his cars.

He asked that if this matter of car mileage should be brought up between them and their managers they would tell them that there was a way in which they could ascertain the mileage of their cars on foreign lines. He would guarantee that on the largest roads it would not require the employment of more than one additional clerk—that would be an expense of say, \$60 per month. He hoped that they would do the best they could with their managers to try and make this thing universal. Let them start on a standard thing in the first place, so that five years from now they would be all alike.

Mr. DAVENPORT asked whether by this system any master car builder could locate his cars at any time.

Mr. DAVIES said yes, any car of his own. In other words, instead of car accountants working two-thirds of the time for connecting lines they were working for themselves. If a car was used in an illegitimate service—as on a gravel train—if they could not stop it, they would know they were getting the service of it.

It was difficult to explain how many mistakes were made in computing mileage. On some roads it was left with the conductors; on others it was taken from the station agents' reports. The conductor may say he took a full train the whole length of the road, when he may have taken only one car the whole distance and the others were taken up at way stations. He would like to state one more advantage in this form: After the mileage for one day was computed, that mileage was carried forward to the blank for the next day. The second day was transcribed on that and computed altogether. If, on the 15th of the month, the manager wanted to know the mileage for the preceding part of the month, you could tell just what it was, because your mileage was carried forward every day. He knew that day that the mileage of their cars on the Baltimore & Ohio was 1,399 miles up to the 10th day of the month. Another point. Some had argued with him and had said: "I could take one of your cars and run it in a construction train ten days or two weeks; what are you going to do about it?" If this was a universal thing and one of his cars was on the Baltimore & Ohio, for instance, and had not moved for four days, he would have them move it.

Mr. SUTHERLAND asked Mr. Davies if a more extended account of his system had not been published. He thought he had seen it in the *Railroad Gazette*.

Mr. DAVIES said that it had been published in the *Gazette*. But those printed remarks are too often read and forgotten. There was another little point: When a car came home with a lot of foreign iron piled on it, it was a very good thing to know who did it. With this system it could be readily ascertained who did it.

Mr. ADAMS said that the adoption of this system hardly came within their province, but they could exert their influence, and that was all that was asked. Apart from the mileage, it was often a very great advantage to know where a car was.

Mr. DAVIES said they might say to their managers simply this: "We understand that our car accountants are doing a great deal of labor for other companies. With this system we do all our work for ourselves. We record our own cars and pay no attention to any one else's." The managers might ask what they were going to do when a road called on them for this or that car. You have told them every day what you have done with that car. If it has passed from your line to some other let them look there for it.

On motion a vote of thanks was tendered to Mr. Davies. The convention then adjourned to the next day.

#### THIRD DAY'S PROCEEDINGS.

After the assembling of the convention Mr. Henry Lange, a civil and mechanical engineer, was unanimously elected to membership.

The report of the Committee on the Place for Holding the Next Convention was presented and adopted.

On motion it was voted to continue the Committee on Train Brakes for another year.

Messrs. Leander Garey and George Rowe were appointed a committee to make arrangements for the next meeting.

Mr. B. F. Stewart, of New Philadelphia, O., presented and explained a model of a train-brake which he had invented.

The Committee on Decrease of Weight in Passenger and Freight Cars presented its report, which we have already published.

Mr. FORD thought this matter required much thought. The idea of reducing dead weight by increasing the capacity of cars was new to him, but he thought it good.

Mr. L. GAREY said that he had frequently expressed this idea of increasing the capacity of cars. He had tried it in practice, having built some cars ago 125 eight-wheel coal cars to carry 15 tons each. Those cars had run well and lasted well, and the journals appeared good for several years' service yet. About a year ago he had built 100 four-wheel dump coal cars weighing 9,500 lbs. and carrying eight tons of coal each, and they did so well that 400 more were built. If box cars could be made to carry 15 or 16 tons by adding 500 or 1,000 lbs. to their weight it would be a great improvement. He had now 200 box cars 34 feet long, which frequently carried 16 tons. He did not know the exact weight of these. He had not given much attention to passenger cars. In answer to a question he offered to furnish any member with cuts of these cars.

Mr. KNAPP asked why the ordinary box car could not carry 15 tons. He had known one to hold up 30 tons, though not allowed to run with that load.

Mr. L. GAREY said that he had loaded one of his cars with 25 tons and run it over the roughest places he could find. The only trouble was that an axle sprung. It sprung while the car was standing still. They had run the car off the track and the truck stood very well except the lower bars connecting the pedestals, which sprung a little when on the track.

Mr. ADAMS thought that the increase of capacity was the true way of reaching dead weight. He believed that the present car bodies would carry 15 tons, with the standard axle and a little increase of strength in the trucks. He remembered some years ago loading a car with 50 tons of pig iron, to see if it could be broken. The only result was to bring the springs together. A saving of one ton on a car would be a great gain. He thought that a careful examination would show many axles sprung by heavy loads and a consequent increase of friction.

Mr. FORNEY thought it a great fallacy to assume that the cost of hauling dead weight was one-half cent per ton per mile. If everything was figured out it would not be over one-fifth of a cent. It must be remembered that the cost of carrying a ton of freight included that of hauling the car and engine as well; the cost must be distributed among the three. He believed that the extra cost of carrying dead weight was very much over-rated.

Mr. DAVENPORT said that he had understood that the 15-ton coal cars used on the Pennsylvania were running very well on axles  $\frac{3}{4}$  by 7 in., with very few hot boxes. The present cars had a capacity far beyond their usual load. There was an ob-



jection to increasing the length of cars, because so many freight houses had doors made just to suit the present cars.

Mr. FORNEY said that for every ton of freight there was  $1\frac{1}{2}$  tons of locomotive and car moved, so that a ton of freight really took only two-fifths of the cost of hauling. The cost of hauling dead weight is very much less than is generally believed. The discussion of this question of dead weight had sprung chiefly from the narrow-gauge excitement.

Mr. DAVENPORT said that it was not fair to say that the paying load was only two-fifths of the whole load.

Mr. FORNEY said that in investigating this question he had found that the Fort Wayne road had cut down the dead weight as low as possible and they made it  $1\frac{1}{2}$  times the paying weight. On many roads it is much more. He had seen a statement from one road where the engine and tender weighed more than the paying freight in the train. This would make the dead weight more than  $1\frac{1}{2}$  times the paying weight. Many cars are hauled empty, others partially loaded, and in any event an ordinary box car carried only its own weight of freight.

Mr. STEWART thought that the weight of the engine should not be included, only that of the train.

Mr. ORTTON thought the engine could not be counted as dead weight, though it was non-paying weight. He thought Mr. Forney was right in taking  $1\frac{1}{2}$  to one. On his line he had found it cost  $\frac{1}{3}$  cent. per ton per mile.

Mr. HOPKINS thought it a mistake to assume that the dead weight on the track was an item of very great cost. The depreciation of track did not vary much with the weight of trains.

Mr. SUTHERLAND thought that there would necessarily be a very great saving in using heavier car-loads.

Mr. FORNEY referred to the opinion that the weight of the engine should not be included in that of the train, and asked if that was the case, to what they could charge the expense of moving the engine and the depreciation of the track caused by its running.

Mr. MORE thought that the discussion of train expenses was hardly pertinent to the subject. They might take the size of cars as pretty well settled and turn their attention to making them as light as possible without decreasing the strength.

Mr. KIRBY thought it unnecessary to change the size of our present cars. Most of them would carry 15 tons very well, though a little strengthening of the trucks might be well.

Mr. AYLESBURY had no doubt that the car-bodies were strong enough to carry increased weight. The only trouble was with the trucks, the small axles and the draw-timbers, which should be made heavier.

Mr. C. E. GAREY had known an old stock car to carry 19 tons for some distance. If it could do that our present box cars could certainly carry 15 tons with the standard axles. There was another thing to be considered, however, and that was the ability to stand shocks and collisions.

Mr. AYLESBURY asked what the capacity of the 33-foot cars on the Lake Shore road was.

Mr. KIRBY said that those cars were not built to carry extra weight, but to accommodate certain classes of bulky goods, such as furniture, of which they had a great deal to handle. He saw no need for increasing the size of cars to carry more weight.

Mr. FORD said that they should remember that with many classes of freight it was impossible to put 15 or even 10 tons in a 28-foot car. Further, that with heavier loads the cars would wear out much sooner.

Mr. AYLESBURY said that he had had one of the 33-foot Lake Shore cars in a collision on his road and all the sills were broken in the centre.

Mr. MORE had seen cars of two different roads, on one of which they made their box cars 2,000 to 2,500 lbs. lighter than on the other, but he could see no difference in their durability. They should lighten up their cars wherever possible. He thought it better to lose a few cars in accidents than to be continually hauling unnecessary weight.

Mr. HOLMES thought too much stress was laid upon weight. Too many officers were calling on them to reduce the weight of cars, but they put no restrictions on agents as to loading cars. Cars were loaded in all sorts of ways. He had seen cars properly loaded with 17 tons and running well, and others with 10 tons, badly loaded, and the journals on one side all hot. Master car builders were often blamed, when the real fault was with others.

Mr. CHILDS thought that there was much more waste in other matters than in the weight of cars. He believed the cars were strong enough, with perhaps some stiffening of the trucks.

Mr. HOLMES thought that they could reduce weight by using only thoroughly seasoned timber. Too much green timber was put into cars, causing them to give way and break down when they ought to be doing service if they were properly built.

The report of the Committee on Springs for Passenger and Freight Cars being called, Mr. KIRBY stated that no report had been prepared.

On motion, the committee was continued for a year. The Committee on Resolutions presented a report, which was adopted.

Mr. CHAMBERLAIN, for the Committee on Standard Axle, stated that, owing to the sickness of the chairman and other causes, no report had been prepared.

Mr. ADAMS stated that he considered the appointment of the committee illegal and would have protested at the time but for the intercession of the President.

Mr. L. GAREY said the whole matter had been a concession to Mr. Van Houten, but he had failed to respond to the courtesy.

On motion the matter was then laid on the table and the committee discontinued.

On motion of Mr. WILDER it was resolved that the President and Secretary select a committee of five to gather all the information possible as to the standard axle, and to report to the next convention whether any alteration is advisable. The appointment of the committee on the Association Rooms in New York was then referred to the President.

The Committee on Subjects for Next Meeting then presented its report (already published). The committee further stated that the subject of refrigerator cars was brought up, but, as they were patented articles, the Committee was unwilling to take it up in that form.

The Committee to Nominate Officers presented a report. After some discussion, during which it was stated that the committee would not feel at all hurt at the rejection of their nominations, resolutions were passed continuing the present officers in their respective positions for another year.

Mr. L. GAREY had previously returned thanks for the compliment proposed but had asked to be relieved. The resolution to continue the officers, however, was passed without a dissenting vote.

Messrs. George Hackett, D. Sutherland, R. B. More and B. K. Verbruyck were then nominated for the office of Treasurer, in place of Mr. Aaron Steinbach, deceased. Mr. Verbruyck was elected.

The Convention then adjourned to meet at Niagara Falls on the second Wednesday of June, 1878.

## MASTER MECHANICS' CONVENTION.

### Discussion of Report on Boilers.

After reading that portion of the report relating to the best material for the shells of boilers:

Mr. WELLS suggested that each section of the report be taken up and discussed separately.

The President approved the suggestion and thought the section read should be submitted for discussion at once.

Mr. SETCHEL advocated this course, for the reason that if

only one subject at a time was taken up the discussion would be clearer and more to the point, and individual experience would be better brought out.

Mr. SEDGLEY had used steel for the outside shell for seven years, for five years exclusively, and had had trouble in one instance only and that could be traced directly to bad construction.

Mr. SETCHEL used iron and found that the great trouble was with pitting in the bottom of the boiler. He would like to know if there was the same trouble with steel.

Mr. SEDGLEY believed that steel had twice the endurance of iron. It would not waste away or corrode as fast as iron. On some parts of his road the water was so bad that the bottom plates had to be renewed in three years, if of iron. He had used steel for seven years and none of the shells required renewal.

Mr. WILDER asked if the corrosion took place outside or inside. He had had boiler plates corroded outside so that he had to renew them. He had lately inspected a number of boilers and found no corrosion except a little around the rivet heads where the brasses were riveted on.

Mr. SEDGLEY said that the corrosion was from the inside always and from corrosion at a seam. He had had seams furrowed so in 18 months that there was only  $\frac{1}{16}$  in. of iron left.

Mr. SETCHEL said that corrosion took place, not only at the seams but all over the bottom of the boiler.

Mr. FRY said that this was a question of very great importance. He had a number of English reports and they all showed many accidents resulting from pitting just as it had been described. Steel was altogether preferable to iron where bad water is used. He had never had boilers pit, but he approved Mr. Sedgley's opinion.

Mr. YOUNG had had two steel boilers in use five years on a road where there was much corrosion. He had lately examined them and found them free from corrosion. His trouble had generally been from the outside.

Mr. WELLS had had steel boilers in use only four years, and had had no trouble with them. With his iron boilers he had found pitting to take place in the bottom of the barrel, near the front tube sheet. In one case a hole worked clear through the shell. He believed steel to be less liable to corrosion than iron.

Mr. WILDER was inclined to think that pitting resulted generally from mechanical action. Chemical action would be more diffused over the whole sheet.

Mr. BLACK said that his boilers pitted near the centre of the boiler and above the water line generally, but sometimes at the bottom.

Mr. WHITE thought that pitting might result from breaking the surface of the iron in calking. This would permit chemical action in spots.

Mr. FRY mentioned an instance of an iron boiler pitted badly on the bottom. He had never seen anything of the kind with steel.

Mr. ANDERSON had found an iron shell with 14 pits or corrosion, varying from the size of a pea to  $2\frac{1}{2}$  in. diameter and from two to six inches apart. Where there were no pits the iron was perfectly sound. He had had boilers corroded entirely through. He knew of no mechanical force which would explain this pitting.

Mr. SIMONDS had found corrosion taking place all along the bottom of the boiler. He had taken out sheets corroded nearly through close to the seam while the iron in the lap was as thick and sound as ever. He had one boiler that was put in service in 1842 on a Rogers engine and the shell now appeared to be as sound as ever. He thought that prices of iron had been forced down so that the makers, in spite of improvements in the manufacture, were forced to look at quantity instead of quality in their production. He believed that there must be imperfect spots in the iron. If the sheets were of even quality they must wear evenly. The trouble, he thought, was more in the manufacture of the iron than in the material. He had had boilers run 30 years and others that were out in three years. He had had little experience with steel, but believed from the method of its manufacture that it would give better service than iron. He had one steel boiler that had cracked on each side, but, on removing the flues, he found it looking very sound and safe inside. It had not been running long enough for corrosion to take place.

Mr. JEFFREY thought that the action of the mechanical and chemical forces was closely allied. The expansion and contraction of the boiler was greatest in the upper part, and the strains would necessarily be greatest in the vicinity of the seams, they being the weakest parts. These constantly changing strains would disturb the grain of the iron in the vicinity of the seams and thus open the way for chemical action to take place there. Where the thickness and fibre of the metal were uniform corrosion must take place uniformly. Then there were imperfections, soft spots, in the iron, resulting from mechanical imperfections in the process of manufacture. When the surface of the sheet was broken or disturbed, chemical action would result on these soft spots, producing the pits or corrosion. Defects caused either in the manufacture of the sheet or in the manufacture of the boiler opened the way for chemical action. It was a slow but sure process. After long and careful observation he had come to the conclusion that the excess of strain in the vicinity of the seams impaired the iron there and gave the acids and salts in the water a chance to work on the iron there. If the sheet was entirely homogeneous there would be uniform wear, and when pitting and furrowing took place it was fair to assume some local cause. He thought that local cause could be found in mechanical defects in the iron. He had used steel in boiler shells long enough to form some judgment about it, and he preferred it to iron on account of the greater homogeneity and closer grain.

Mr. PEDDLE had had much trouble with pitting and furrowing in iron, and agreed with Mr. Jeffrey as to the cause. He had found the main tube sheets liable to this pitting as well as to corrosion around the corners. He thought that there could be no mechanical action sufficient to explain this pitting; it must result from chemical action.

Mr. SIMONDS thought that there was not as much work put upon iron as formerly. It was poor economy to force down prices to a point at which good iron could not be produced.

Mr. WELLS thought there could be little doubt as to the chemical action. In examining boilers that had pitted he had always found the pits covered with a thick black scale of iron and other substances. Pitting occurred near the bottom of the boiler, generally toward the front end; furrowing was at the seams and corners. He believed both to be produced by mechanical action in the first place, breaking the surface and opening the way for chemical action. The fibre was broken and the raw iron exposed. The furrowing always took place where the iron was liable to spring.

Mr. WILDER thought that the various mechanical disturbances in punching the rivet holes, calking, etc., had much to do with furrowing near the seams.

On motion the discussion was closed, and the next section of the report, that on the best material for fire-boxes, was taken up.

Mr. WELLS referred to the report of last year and said that the Committee had had nothing to do but to reason from one point to another. Granting that cracking of fire-box sheets was caused by tensile strains, the next question was the cause of those strains, and no cause could be found but inequalities of temperature. He then referred to the experiments made by the Committee and detailed at length in the report.

Further discussion was then postponed on account of the ar-

rival of the time fixed for the proposal and discussion of questions.

At a subsequent point in the session, after the reading of that portion of the report on changes in the proportion of boilers in general use:

Mr. WILDER said that he was not clear as to whether it would be any benefit to increase the number of tubes. For instance, in repairing an engine on his road that had 168 two-inch tubes the number and size of the tubes was decreased, but the engine had since done the same work as before, using about the same fuel and steaming as well.

Mr. FRY thought it strange that there was such uniformity in the size of flues, and that so few trials of different sizes had been made. Nearly all the roads used flues 2 or  $2\frac{1}{2}$  in. diameter. In England it was not uncommon to use flues  $1\frac{1}{2}$  in. diameter. It would be very valuable if they could get information as to the effect of using flues of different sizes with different kinds of fuel; or the effect produced by increasing the number or diminishing it. The distance between the flues seemed to him to have a very important effect upon the steaming qualities of a boiler. The rapidity with which steam could escape from the heated surface of the flues should have a marked effect on the steaming of the boilers. By decreasing the number or size of the flues they would increase the freedom of circulation.

Mr. SELLARS had experimented by cutting out a number of the flues without seeing any marked difference. He had at one time taken an engine with 160 flues and plugged up 10 at a time, without the knowledge of the engineer. In this way he kept on until 60 flues were plugged before the engine showed any difference. He was satisfied that too many flues were generally used. All that was required was flues enough to carry off the heat, gas and smoke from the fire-box. He had estimated the velocity of the draft through the tubes at 50 or 60 miles an hour. There was no time for the radiation to be noted at all. The operation of an engine was harder or lighter as the draft was greater or less, and it was necessary only to have flue capacity enough to carry the draft.

Mr. YOUNG said that he had built an engine some years ago with 180  $1\frac{1}{2}$  in. flues, to get as much heating surface as possible. After running three years he had found much scale. The engine was not a very good steamer. He then put in 157 two-inch flues, arranging them vertically, and the engine has since steamed much better.

Mr. SPRAGUE thought that if an engine steamed well with so many flues plugged up there would be a great improvement if they were taken out altogether, on account of the improved circulation.

Mr. HANSON had tried many experiments and was convinced that the arrangement of the flues had a great deal to do with the steaming, as well as the number. On one engine he had taken out 11 flues, and it gave a better water-space and circulation; the engine steamed better, held her water better and used less fuel. He had tried the same thing with several engines where the space between the flues was narrow and always with good results. The flues were too often overcrowded. He had taken out  $1\frac{1}{2}$  in. flues and put in  $1\frac{1}{4}$  in. and found an improvement. He believed that the small tubes would not allow a free enough passage for the gases.

Mr. WILDER said that the heat imparted by the flues was by induction only; that from the fire-box both by radiation and induction. With wood-burning engines the flame passed into the flues some distance, much more than with coal.

Mr. SPRAGUE thought it would be well to try flues larger than two inches. He believed a  $2\frac{1}{2}$ -inch flue 11 feet long would give better results than a two-inch flue eight feet long. He believed that a  $2\frac{1}{2}$ -inch flue would give better results, and that there would be economy in building the boiler also.

Mr. WELLS said that the committee had had no reports from members using larger flues than two inches. He believed, however, that the Pennsylvania was using flues  $2\frac{1}{4}$  and  $2\frac{1}{2}$  inches in diameter. As to reducing the number of flues, any better result so obtained must result from the better circulation obtained, certainly not from reducing the heating surface.

Mr. SHAPER said that on the Pennsylvania they used  $2\frac{1}{4}$ -inch flues for freight and  $2\frac{1}{2}$ -inch for passenger engines. They preferred the larger flues for passenger service.

Mr. PEDDLE had used  $2\frac{1}{4}$ -inch flues and thought them better where the flues were very long. For a length of 10 or 11 feet he had found the two-inch flues the best. He thought that it would not do to put the flues closer than  $\frac{1}{2}$  inch. With less space there was not a good circulation. But with, say 150 flues  $\frac{1}{2}$  or  $\frac{3}{4}$  inch apart there would be no trouble as to circulation. Some time since Mr. Hayes had found a temperature of 800° in the smoke-box. Now the nearer they could come to extracting the heat in the tubes the better they would do. Too few flues and too rapid draft caused this excessive heat in the smoke-box.

Mr. HANSON said that in the boilers he had mentioned, taking out some of the flues had enabled him to increase the space between the rest to very nearly  $\frac{1}{2}$  inch, and it was that which made the improvement. They could not spread the tubes and retain the same number without enlarging the shell, but by decreasing the number and spreading them further apart they had found that the improved circulation more than balanced the loss of heating surface.

Mr. HAYES said that it was evident that much heat passed off unutilized. If the number or length of the flues could be increased some of this might be saved. He had experimented by inserting in the smoke-box a thermometer and also plugs of metal fusible at a known temperature. In this way he had found 700° of heat. Lengthening the flues was hardly practicable, but something might be done, by increasing the number, to utilize this waste heat, provided the tubes were not put too near together.

The reading of the report was then completed. The other sections of the report were not discussed.

After the conclusion of the report it was accepted as a whole, without further discussion. A vote of thanks to the committee was then unanimously passed and was acknowledged by Mr. Wells.

## The Competitive Forces Which Exert a Controlling Influence Over the Movements of the Internal Commerce of the United States.

[From the First Annual Report of the Internal Commerce of the United States, by Joseph Nimmo, Jr., Chief of the Division of Internal Commerce: being Part Second of the Annual Report of the Chief of the Bureau of Statistics on the Commerce and Navigation of the United States.]

The subject of competition presents itself under two very important aspects: first, as a force controlling or exercising a strong influence over the movements of commerce, and, second, as a regulator of freight-rates. It is not proposed to enter here upon an exhaustive discussion of the question as to how far competition may be relied upon as a regulator of rail-rates, nor is it proposed to investigate fully the question as to how far competition produces or checks discriminations in freight-charges; for, under different circumstances, it tends to both these results. The subject can only be considered in a somewhat general manner.

Competition exists under very complicated conditions with respect to the "through traffic" between different sections of the country, and in so far as relates to the end of securing cheap transportation it is an effective, although not an absolute, regulator of through rates. It does not prevent certain discriminations with respect to the interest of rival commercial centres, nor does it prevent exorbitant local rates or discrimi-



nations against local traffic. In certain cases, combination in a great degree suppresses competition, but it has been found that where there are many competing lines, these lines have no few interests in common that it is very difficult to maintain agreements as to competitive rates. The trunk lines at all times engage in through traffic at rates very much below those which prevail where there is little or no competition, and in some cases, they are forced to engage in competitive traffic at an absolute loss.

Generally it may be said that the competition of rival lines and of rival markets is much less effective as a regulator of local than of through rates; but in regard to a very considerable proportion of the local traffic of the country the influence of the competition of product with product in various degrees limits rates. In many cases the competition of the markets exerts but little influence, and between the extremes of the influence of this competition over both through and local rates, it asserts itself in every gradation of force and under an almost infinite variety of circumstances.

As the local traffic of railroads constitutes a very much larger proportion of the commerce of the chief Atlantic seaports than does their commerce with the Western and Northwestern States, it is evident that the railroad problem presents to each of those cities many questions of vital importance, which cannot be considered in a report especially devoted to the commercial movements between States and between different sections of the country, and the circumstances and conditions which characterize those movements.

The present consideration of the results of competition relates to some things which it does, rather than to what it does not do. The latter subject opens an almost illimitable field for inquiry and discussion.

#### COMPETITION.

As soon as it was realized in England and in this country that the safe and economical management of a railroad rendered it necessary that the work of the common carrier should be performed by the management of the road itself, it was confidently predicted that the power of the railroad companies would eventually become so great and their control over the commercial and industrial enterprises of the people so absolute that it would become necessary for the State to govern the railroads in order to prevent the railroads from governing the State. Notwithstanding the fact that many of the evils apprehended have exhibited themselves in different degrees, experience has proved that the system contains within itself certain conservative elements, which, in the more advanced stages of railroad extension, assert themselves as regulating forces, although not to the extent of preventing all discriminations or of correcting all the abuses which have from time to time arisen. But this much is not to be expected in the course of human affairs, either as the result of the untrammelled action of natural forces or as the product of any scheme of adjustment.

At an early day in the history of railway legislation, the Duke of Wellington uttered this word of warning in the British Parliament: "Beware, my lords, lest in legislating in favor of railroads you lose sight of the old English idea of the highway." But the freedom of the highway, in the sense in which the term is employed with reference to transportation on wagon-roads, on canals, on rivers, and upon the ocean, has been entirely eliminated from railroads, and yet many of the evils apprehended have not been realized under the privileges and powers of independent corporate ownership. Monopoly has not strangled commerce, for competition, the natural regulator of values, has appeared under new conditions, and in the determination of rates for the transportation of both passengers and freights it appears to have kept pace with the development of the possibilities of the railroad system, although, as just stated, not to the extent of preventing all abuses.

Experience has proved that the system under which the entire freight and passenger traffic of railroads is conducted by the management of the railroad companies themselves, as common carriers, has been the most important condition under which the present advanced state of railway transportation has been attained. Regularity of movement, reduction in cost, security, accountability, dispatch—all these invaluable results are due to this peculiar feature of the system at first believed to be fraught with such serious evils.

Some of the features of monopoly always have and perhaps always will attach to the railroad system, but they will continue under certain restraints growing out of the competition between rival transportation lines and between rival markets. As we have also seen, these restraints operate under widely different conditions with respect to what are known as "competitive" and as "local" traffic.

During the first twenty years of railway construction in the United States there were comparatively few competing railroads. The companies sought new routes, where they could enjoy exclusive privileges. But in the course of a few years competing lines were constructed between the important centres of trade. In certain cases rival companies, seeing that competition would be disastrous to both, entered into combinations as to the rates which should be maintained. In other cases the two roads were consolidated under one ownership. This led to the impression that eventually there would be no effective competition between rival roads. George Stephenson, the father of the railroad system of Great Britain, expressed the opinion that wherever combination is possible competition is impossible, and the inference was generally drawn that competition may always be suppressed by combination. Experience has proved the fallacy of this idea. Perhaps the most extensive combinations and consolidations of railway interests in the world are those which have been formed by the trunk lines connecting the Western and Northwestern States with the States of the Atlantic seaboard. These combinations and consolidations were originally entered into by the various railroad companies for the purpose of controlling commerce between the East and the West; but it is well known that the most ungovernable competition is that which now exists and which has existed for several years between those great rival trunk lines, and it is also a fact that the rates which have for several years prevailed upon those roads have been the cheapest rates known in this country, and perhaps in the world. Strenuous efforts have been made by the managers of the trunk lines to advance competitive rates and even to maintain very moderate rates, but oftentimes unsuccessfully. Competition between the trunk lines and their various connecting lines, and other forces beyond the control of the managers of those lines, have thwarted their efforts, and the result has been that the cheapness of through rates enforced upon these great companies has given rise to complaints of unjust discrimination with respect to rates between points where the commercial advantages of competition do not exist. It is averred that the great trunk lines have, during the last two years, engaged in the competitive traffic between the West and the seaboard at rates below the actual cost of transportation.

As the results of the efforts of the promoters of railway consolidations and combinations, we now see that it is impossible for these great trunk lines to combine for the determination of rates, except as to certain classes of traffic and within limits imposed by the economies of transportation and by commercial forces beyond their control.

#### CIRCUMSTANCES WHICH TEND TO REGULATE RAIL-RATES.

Let us consider briefly some of the forces which in practice tend to regulate freight charges on American railroads in so far as relates to the great commercial movements between the West and the seaboard.

First, Between each of the principal commercial cities of the West and each one of the chief Atlantic seaports there are sev-

eral competing lines formed by the trunk roads and their connections. One or more of these lines may regard the through traffic between certain centres of trade as a principal source of revenue. Other lines may regard it as a mere adjunct to their local business or as an adjunct to their more important through traffic between other points. In the latter cases the companies may be satisfied with any rate which will yield more than the mere cost of handling and hauling, and therefore be inclined to compete for the traffic at very much lower rates than the managers of other roads would desire to maintain.

Again, take the case which in practice has almost innumerable illustrations. Between two centres of trade there are several competing lines differing widely as to distance, grades and amount of traffic, and as to all the other conditions determining cost of transportation. It oftentimes occurs that the managers of the longer or more unfavorably situated lines see clearly that they can secure a share of the traffic only by taking it at rates below those prevailing on the more favorably situated roads. Unlucky the demands of the managers of the longer lines are complied with a railroad war ensues, with the inevitable result that all the roads are subjected to very much greater losses than would have been sustained even under the terms of an agreement which might not have been deemed altogether satisfactory to any one of them.

Second, The financial condition of railroads has an important bearing upon the question as to the rates which may be charged under certain circumstances. In the case of the competitive business between a commercial centre at the West and an Atlantic seaport, several of the lines pay dividends upon their stock, and they require certain rates of transportation in order to meet dividends and the interest upon their bonded indebtedness. There are other roads which can barely pay interest upon their bonds. There are also competing roads which are in a condition of bankruptcy, being unable to pay even the interest on their bonds. These roads, while struggling for existence under some form of compromise or of financial adjustment, are willing to take freights at rates very little in advance of the mere cost of moving them. About the first of March, 1876, a practical example of this sort was presented on a very large scale. The trunk lines from Chicago to the East (all solvent roads) formed a combination upon the basis of "pooling" earnings. Their efforts to fix the rates on grain were, however, defeated by the competition of certain bankrupt railroads south of Chicago, having connections with almost all the Western railroads. The strategic position held by these bankrupt roads as the result of their low financial condition enabled them to drive their more prosperous competitors from a chosen position.

Third, The competition of product with product in the markets of the country is in some cases an effective restraint upon freight charges, while in other cases it exerts practically but little influence, but in all cases it exerts in some degree a restraining influence upon rates. The trade-forces of the country are oftentimes stronger than the power exercised by the railroad companies with respect to traffic between the more important centres of trade.

Either directly or indirectly the markets of every commercial city bring to bear upon the freight-rates of each one of the railroads tributary to it the competition of all the other tributary roads, as well as the competition of all the railroads tributary to rival commercial cities. This is a fact which forces itself upon the notice of the managers of every railroad in the country, and which is recognized by them as establishing limits within which their discretionary powers with respect to competitive traffic are restrained. The degree of control exercised by every commercial city over the movements of any particular commodity depends upon many circumstances, among which may be mentioned the magnitude of its total commerce, the amount of its available capital, the energy, tact and enterprise of its merchants, its geographical position, and its various facilities for transportation, including both rail and water lines.

In some cases railroad managers exercise a very wide discretion in the establishment of freight charges, and in other cases their powers are restrained within very narrow limits. But the commercial forces always assert themselves. The competition of product with product in the various markets is widely diffused and presents itself under many varied aspects. The markets cannot enter into any sort of combination among themselves or with railroad interests. Although oftentimes dormant, the competitive influence of trade always asserts itself over transportation lines. It is a statical rather than a dynamical agency.

The construction of railroads throughout the United States has vastly extended the geographical limits of the trade of commercial cities. The territory tributary to the commerce of each city overlaps the territorial limits of the commerce of several other cities. This has led to very marked results in commercial affairs. For example, competition between markets and between transportation lines brings to New York certain products of Illinois and Iowa at rates little in advance of the rates upon the same commodity from local points within 100 miles of that city. Thus railroads have in a very striking manner tended to diminish the effect of distance as an element of the cost of transportation and to equalize values throughout the country.

With respect to the through traffic between the West and the seaboard the combined trade and transportation forces determine the maximum limit of the charges which can be imposed by the feeblest of the bankrupt connections of through lines, and to almost the same extent they determine the rates which can be charged by that gigantic organization, the Pennsylvania Railroad Company. The competition between markets is so closely intermingled and presents such a variety of phases that it is oftentimes impossible to define the relative influence of any particular market. The following statements in regard to actual commercial movements in the United States serve to illustrate the influence of the competition of rival lines and of rival trade forces over freight rates on railroads engaged in what is commonly known as "through traffic."

(a) The competition between New York, Philadelphia, Baltimore, Chicago, St. Louis, Louisville, Cincinnati, and other trade centres in a great measure controls freight rates on all the lines engaged in transportation between the West and the seaboard, as well as on ocean rates in our coastwise trade and in our trade with other countries. A single illustration in proof of this fact may be given:

There are not less than twenty different lines or combinations of lines over which grain produced in the Western States can be transported to the cities of New York, Boston, Montreal, Philadelphia and Baltimore. Some of these are all-rail lines, others are rail and water lines combined, and there is also the lake, Erie Canal and Hudson River route. The lines to each one of these cities compete with each other, and in consequence of the identity of their interests with the interests of their respective seaport termini, compete with the lines to all the other ports.

There are also at all of these seaports one or more ocean steamer lines to Europe, which compete with each other quite as sharply as do the railroads. The rates which can be obtained both on the internal and on the ocean lines of transport are therefore governed by the competition between all these lines, as well as by the grain markets of the various Atlantic seaports of the United States and the grain markets of Europe.

England is our chief grain market, but she also receives grain from Russia, Turkey, Austria, Egypt, Spain, Portugal, Morocco, South America and Australia. The price of grain in the English market is regulated by the available supply from all these countries and by the freight rates which prevail from

each country to England. All these competitive elements of commerce and of transportation react upon the railroads and interior water lines of the United States and to a certain extent constrain the railroad manager in the adjustment of his rates on grain. Thus the condition of the grain markets of Europe and the ocean rates on grain from Russia to England may exert a potential influence over the rates which can be charged on a branch road in one of our Western States.

(b) The effect of the competition of the markets upon railroad freight tariffs may, however, be illustrated in special cases as well as in this world-wide competition. Suppose, for example, a grain market at A having several roads leading into it from B, C, D and E, each one of which engages in the transportation of grain from all points on its line. Evidently on no one of these lines to the common market A can the rates be advanced very much beyond the rates which prevail on the other lines, as the effect of such an advance would be to check production and reduce traffic on that line. Thus railroads compete with each other through a common market, and the commercial forces are found to be to a certain extent regulators even of that local traffic over which railroad managers are sometimes supposed to exercise absolute control.

(c) Upon this subject Col. Milo Smith, of Clinton, Iowa, in a letter to this office says:

"The competition is between cities rather than between roads, and for that reason no combination among the roads can ever last very long."

(d) Mr. Albert Fink presents an illustration of the competitive power of markets as follows:

"Nashville is a manufacturing point for flour, and its chief Southern market is Atlanta. St. Louis and Chicago are also important centres of the flour trade and compete for the trade of the entire Southern States. St. Louis having the advantage over Chicago, on account of shorter rail lines to the South and of transport by river. The average rate of transportation from Nashville to Atlanta is 72 cents per barrel of flour, and the rate from St. Louis to Atlanta is \$1.16. In case the St. Louis rates are reduced to 65 cents, which may be considered a 'war rate,' the Nashville rate must of course be reduced proportionately, or else Nashville flour will be excluded from the Atlanta market. The interests of the Nashville manufacturers and merchants and the railroads carrying flour from Nashville must otherwise suffer. And as there would be no market for wheat raised on the various roads centering in Nashville which carry it to that point as a part of their local traffic, the local rates on these roads must also be reduced in order to prevent the distant market of St. Louis from destroying the Nashville trade. Thus competition between markets induces competition between transportation lines which do not come within 300 miles of each other."

(e) In March, 1876, a "pooling" arrangement was entered into by all the great trunk lines which, with their connections, operate between Chicago and the East. Soon afterward the rates to Eastern points from Milwaukee across Lake Michigan, and thence by the Detroit & Milwaukee and Grand Trunk railroads (both in a condition of bankruptcy), were so reduced as to be 10 cents less on a barrel of flour from Milwaukee than from Chicago. The rates on grain were also made less from Milwaukee than from Chicago. The rates on certain east and west lines south of Chicago—also bankrupt—were, as before mentioned, made less than the rates via Chicago from points farther west. The result of these discriminations was to cause the products of the Northwest to avoid the Chicago market. The competition of the trunk lines both north and south of Chicago, in connection with the direct competition of Eastern markets as against the Chicago market, threatened to make serious inroads upon the trade of that city. If these discriminations had continued, the interests of Chicago would have greatly suffered. But the competitive influences centering there did not permit this condition of affairs to continue long. The merchants presented a protest to the pooling lines, calling upon them to protect the commercial interests of Chicago against such ruinous discriminations. Perhaps, however, this was unnecessary, for there were strong motives of self-interest which impelled the railroad companies to adopt the measures recommended by the merchants. The pool lines lowered their rates and the discrimination against Chicago ended. The circumstances which governed in this case are apparent. The interests of all the railroads centering in Chicago from the Southwest and Northwest are closely identified with the commercial interests of that city. To it they haul loaded cars, and there they receive the largest amount of return freights. The whole economy of transport naturally leads them to favor through traffic to and from Chicago, rather than to allow freights to be diverted to lateral lines. All the great trunk lines which, with their connecting lines, operate between Chicago and the East, namely, the Grand Trunk, the New York Central, the Erie, the Pennsylvania and the Baltimore & Ohio railroads, depend very largely upon the enormous Chicago markets for their east-bound freights, and they are able to secure a larger amount of traffic to that city than to any other Western point. Freights can be transported in large quantities a distance of nearly a thousand miles without breaking bulk much more economically than if received from numerous branch lines at various intermediate points. The economies of transport therefore closely ally the interests of the railroads mentioned to the commercial interests of Chicago.

Facts of this nature tend to show how strongly the interests of the roads lead them to frame their freight-tariffs in such a manner as to favor the interests of great commercial cities. They also show that the equilibrium of competitive forces is an exceedingly delicate one, and that a small difference in rates may produce very important commercial results.

(f) The following illustration of the competition of rival markets is presented by Mr. J. D. Hayes, of Detroit, in a statement to this Department:

"The class of freights termed 'special' grew out of some cargoes of coffee being landed at Baltimore for St. Louis, together with some other circumstances which the Northern roads could not control. Sugar, molasses, crockery and coffee entering into the daily use of every household, they became what merchants term 'close articles,' the freight forming a large percentage of cost, and they, too, were placed in the class termed 'special.' These commodities being largely of Southern production could be taken via New Orleans to St. Louis at very low rates, and unless something was done to aid the Chicago merchants to compete with their St. Louis rivals, they and the Northern roads would get no share of that class of business. Therefore the 'special' class became a mutual thing for the protection of traffic over the Northern roads and for the Northern merchants."

The same commodities, however, when shipped from Chicago and St. Louis to interior points, are placed in a higher class and the freight charges are based upon local rates, and in some cases, as stated by Mr. Hayes, the charge for 100 miles "local" is greater than for 1,000 miles on the through trunk lines. This case illustrates the influence of several distinct classes of competitive forces: First, the competition between vessels on the ocean, when employed in bringing the various commodities embraced in this "special class" from the countries in which they are produced to the port of New Orleans and to the several Atlantic seaports; second, the competition between the market of New Orleans, Baltimore, Philadelphia, New York and Boston for the importation and distribution of the commodities composing this class of freights; third, the competition between the various trunk lines connecting the West and the Atlantic seaboard; fourth, the competition between the Mississippi River boats and the roads from the Gulf ports to the Western and Northwestern



States; *fifth*, the competition of the east and west lines with the north and south lines mentioned; *sixth*, the competition between the markets of Chicago and St. Louis and the competition of all the important trade centres of the West for the same trade; *seventh*, the competition between rail lines from Chicago and St. Louis and the other centres of trade to the points of final destination.

Evidently the great trunk lines, with all their powers of capital and organization, are as much constrained as to their rates upon this class of freights, by the all-pervading influence of competition, as are the ships, which are free to engage in any traffic and to follow any course upon the trackless ocean. In so far as relates to this particular traffic, and in fact to all traffic other than that which is strictly local, the railroad, by virtue of the physical fact that it is confined to one route, is even more circumscribed in its competitive influence than is the ship upon the ocean.

(g) The subject under consideration was illustrated by recent events in connection with competition between the trunk lines from Chicago and St. Louis to the Atlantic seaboard. The facts in this case were furnished by Mr. George H. Morgan, Secretary of the Merchants' Exchange of St. Louis.

The various lines east from St. Louis formed in April, 1876, a combination to maintain rates by means of the arrangement known as "pooling." It happened, however, that during the existence of this combination a war of rates prevailed between Chicago and the East, by means of which rates from Chicago were reduced below the actual cost of transportation. The effect of the maintenance of the St. Louis rate was simply to divert competitive business from St. Louis to Chicago, including both receipts from the West and shipments to the East. In regard to this subject Mr. Morgan says:

"If the freight on flour, wheat, corn, tobacco, lard and pork to eastern markets during the first six months of the year 1876 had been based upon the same rate per mile as prevailed from Chicago the saving to St. Louis would have amounted to about \$360,000 on the freight alone, and such reduction would have greatly stimulated trade at St. Louis instead of depressing it by rates discriminating against its commercial interests."

In a subsequent letter, dated May 29, 1876, Mr. Morgan says: "The burden imposed upon the commerce of St. Louis became so oppressive under the pool that our merchants could no longer submit to it. About two weeks ago, therefore, a committee was appointed from the Merchants' Exchange to wait upon the Executive Committee of the pool and demand that St. Louis be put upon an equal footing as regards eastern freights with other competing cities. The demand was acceded to, and we have now a tariff based on the tariff at other points. The rate from Chicago to New York is 20 cents; consequently the rate from St. Louis to New York is 23.2, being 16 per cent. more, according to distance. Thus the great principle we have been contending for has been established, and our railroad men promise to keep St. Louis on a par basis hereafter."

The most prominent competitive forces in this case were, first, the two rival commercial cities, and second, the rival roads. The interests of the roads are evidently very closely identified with those of their terminal cities. In the case of the St. Louis roads, all that was required was an understanding of the mutual interests of the city and of the roads in order to conform rates to those from Chicago.

It is a matter of interest to observe a feature of this case which characterizes commercial movements quite generally, and that is, that an arrangement made for the purpose of regulating any particular line of competitive traffic, incidentally affects important collateral interests. The commerce which is competitive as between St. Louis and Chicago is chiefly embraced within the territory lying north of the latitude of St. Louis and south of the latitude of Chicago. But the railroads from St. Louis to the East, in reducing their rates so as to make them conform to the Chicago rates, were obliged to embrace the traffic coming to them from roads extending from St. Louis to Kansas, Arkansas, the Indian Territory and Texas, and not competitive with respect to the Chicago roads. The single fact of the reduction of the rates east of St. Louis was, therefore, probably felt by railroads extending from interior points in Texas to the port of Galveston, and also by vessel owners engaged in the transportation of the products of Texas from Galveston to the North Atlantic States and to foreign countries, as a reduction of rates on the overland or all-rail route from the interior of Texas by the way of St. Louis would naturally tend to increase the movement of cotton by that route, and to diminish the movement by the way of Galveston, or to compel a reduction of the rates by the latter route.

(h) The following extract from a statement made to this department by Mr. Charles Randolph, Secretary of the Chicago Board of Trade, points to the fact that the elements of competition are constantly increasing, and that in the course of the development of the railroad system it is becoming more and more difficult to form combinations between competing trunk lines for the arbitrary determination of rates:

"I think the multiplication of avenues for transit, and especially the lack of dividends to stockholders, and also the extremely low rates for the past two years prevailing for water transit, is certainly weakening the power to combine. The completion of the Baltimore and Ohio line to this city seems to have demonstrated that the introduction of a new competitor brings to the question more of complication and more of a disposition to act independently. Although it appears to be a somewhat uncomfortable rival, late developments indicate that it is by no means averse to co-operation in agreed rates. Its recent arrangement with the Erie Railway, forming a line to New York, entirely independent of either the New York Central or Pennsylvania, gives it great additional power for peace or war. Other lines, mainly through Canada, are nearing an independent through connection and with increased and more varied interests it would seem that combinations are much less liable to be made effectual or lasting."

(i) The exceedingly wide range of the competition between rival transportation routes for traffic between important trade-centres is very strikingly illustrated by facts which have been presented by Mr. Albert Fink in reply to inquiries from this office concerning the routes which actually compete for traffic between the cities of Saint Louis and Atlanta, Ga. Saint Louis is an important market for such western products as are shipped very largely into the Southern States, and Atlanta is one of the most important distributing centres of these products throughout the South Atlantic and Gulf States. The various routes competing for this traffic are shown in the following schedule:

Distance from St. Louis to Atlanta, Ga., by various routes:		Miles.
(a) St. Louis to Baltimore.....	920	
Baltimore to Richmond by York River.....	203	
Richmond to Atlanta.....	547	
Total.....	1,670	
(b) St. Louis to Baltimore.....	920	
Baltimore to Richmond by James River.....	258	
Richmond to Atlanta.....	547	
Total.....	1,725	
(c) St. Louis to Baltimore.....	920	
Baltimore to Norfolk by steamer.....	165	
Norfolk to Atlanta via Lynchburgh and Chattanooga.....	650	
Total.....	1,735	
(d) St. Louis to Baltimore.....	920	
Baltimore to Norfolk by steamer.....	165	

Norfolk to Atlanta by Wilmington and Augusta.....	705
Total.....	1,709
(e) St. Louis to Baltimore.....	920
Baltimore to Wilmington by steamer.....	450
Wilmington to Atlanta by Charlotte.....	453
Total.....	1,823
(f) St. Louis to Baltimore.....	920
Baltimore to Charleston by steamer.....	557
Charleston to Atlanta by Augusta.....	310
Total.....	1,787
(g) St. Louis to Baltimore.....	920
Baltimore to Savannah by steamer.....	640
Savannah to Atlanta.....	295
Total.....	1,855
(A) St. Louis to Cincinnati.....	340
Cincinnati to Huntington via Ohio River.....	160
Huntington to Charlottesville.....	324
Charlottesville to Atlanta via Danville and Charlotte.....	532
Total.....	1,356
(j) St. Louis to Louisville.....	320
Louisville to Nashville.....	185
Nashville to Chattanooga.....	151
Chattanooga to Atlanta.....	137
Total.....	793
(k) St. Louis to Evansville.....	161
Evansville to Nashville.....	182
Nashville to Chattanooga.....	151
Chattanooga to Atlanta.....	137
Total.....	631
(l) St. Louis to Cairo.....	147
Cairo to Nashville via McKenzie.....	101
Nashville to Chattanooga.....	151
Chattanooga to Atlanta.....	137
Total.....	536
(m) St. Louis to Cairo.....	147
Cairo to Memphis.....	109
Memphis to Atlanta.....	447
Total.....	703
(n) St. Louis to Cairo.....	147
Cairo to Meridian.....	356
Meridian to Atlanta.....	567
Total.....	1,070
(o) St. Louis to Cairo.....	147
Cairo to Grand Junction.....	154
Grand Junction to Chattanooga.....	258
Chattanooga to Atlanta.....	137
Total.....	696
(p) St. Louis to Columbus.....	156
Columbus to Atlanta.....	370
Total.....	526
(q) St. Louis to Columbus by river.....	220
Columbus to Atlanta.....	370
Total.....	590
(r) St. Louis to Memphis by river.....	442
Memphis to Atlanta.....	447
Total.....	889
(s) St. Louis to Vicksburg by river.....	832
Vicksburg to Atlanta.....	473
Total.....	1,305
(t) St. Louis to New Orleans by river.....	1,240
New Orleans via Mobile and Montgomery to Atlanta.....	496
Total.....	1,736
(u) St. Louis to New Orleans by river.....	1,240
New Orleans to Mobile by steamer.....	174
Mobile to Atlanta.....	180
Total.....	1,594

The various routes described in the foregoing schedule are delineated on map No. 12, at the end of this report.

In this case we see twenty lines competing for the traffic between two centres of trade, although those lines differ in length from 526 miles to 1,858 miles. In order that each one of these lines may participate in the traffic, it is necessary that they should all carry it at very nearly the same rates. In practice it is found that the longer lines, in order to secure a share of the traffic, are often compelled to reduce their rates below those charged on the shorter lines. In this way it often occurs that the longer lines actually determine the rates. As already shown in another part of this report, the longer line may in many cases be able to carry the traffic at lower rates than the shorter line, in consequence of a preponderance of freights in one direction, magnitude of total traffic, or other considerations of an economic bearing. It appears that, with respect to this particular traffic, boats on the Mississippi River compete with the Baltimore & Ohio Railroad and with ocean steamers plying between the City of Baltimore and the South Atlantic seaports. While all these lines have a common interest with respect to the traffic between St. Louis and Atlanta, each one of them has traffic interests which are not common to all or perhaps to any two of them, and these other interests may be of very much more importance to particular lines than the competitive traffic referred to. Evidently it is impracticable for all these twenty lines to enter into a close combination as to the rates which shall prevail between St. Louis and Atlanta or to maintain any such agreement if entered into.

The trade between St. Louis and Atlanta is also greatly affected by the competition of several rival markets, viz.: St. Louis, Chicago, Peoria, Louisville, Cincinnati, Baltimore and New Orleans. Very little, if any, grain reaches Atlanta by the way of Baltimore or by the way of New Orleans, by direct consignment. Grain which reaches Atlanta by the way of Baltimore is first shipped to the Baltimore market, thence to southern ports by vessels in the coastwise trade, and thence by rail to points of destination. Grain shipped to Atlanta via New Orleans is generally shipped to the New Orleans market and thence to Atlanta in the ordinary course of traffic on transportation lines from New Orleans to that city. The forces which control the traffic between St. Louis and Atlanta are the competition between many transportation lines and the competition between many centres of trade.

This illustration in regard to the competition for traffic between St. Louis and Atlanta is by no means an exceptional one. Many similar illustrations might be presented as to traffic between points at the West and points on the Atlantic seaboard, but the one presented will suffice.

The facts in this case indicate the exceedingly complicated nature of the question as to the determination of freight

charges; a question which must be decided in each case upon the experience and judgment of those whose duty it is to make and to adjust freight tariffs, and who must of necessity be well informed as to the force, in practice, of each one of the conditions hereinbefore mentioned.

(k) A very clear illustration of the extent of competition between common points is presented in map No. 13, showing the transportation lines between the South Atlantic and Gulf States and the cities of Boston, New York, Philadelphia and Baltimore. The rates by these lines are so nearly equal that oftentimes the difference of one cent per 100 pounds will determine the route and the market to which cotton is sent from any particular point.

(l) Very interesting illustrations of competing lines and competing markets are also presented in maps Nos. 8, 9, 10 and 11, at the end of this report. Especial attention is called to the description of these lines in a statement by Mr. Albert Fink. (Appendix, pages 1 to 48, inclusive.) Mr. Fink, having been engaged for several years as superintendent of the Louisville, Nashville & Great Southern Railroad, and for about a year as General Commissioner of the Southern Railroad and Steamship Association, became quite familiar with the competitive struggles of all these lines.

From the foregoing statements as to the circumstances which determine the course and condition of commerce, it is evident that no general combination between the competitive forces of transport and of trade for the regulation of rates between different sections of the country is possible. In the course of the development of the railroad system, many of the fears at first apprehended as to the results of railroad combinations and consolidations have been dispelled. In new and unforeseen ways competition has, in regard to certain very important branches of traffic, become the governing influence.

The new phases under which the internal commerce of the country presents itself, at the present time, are but the outworkings of competitive forces which have been developed by the extension and consolidation of railroads. This is a result which was not anticipated by the projectors of the great trunk lines. Several railroad companies have expended millions of dollars and constructed thousands of miles of railroads in order to gain control over the commerce of this country. But their efforts have been unsuccessful, for the circumstances which surround the railroads of the country are generally stronger than the power which they can bring to bear, either alone or in combination with other lines. Many illustrations upon this point might be adduced. Perhaps this fact has been more fully realized, in practice, by the Pennsylvania Railroad Company than by any other railroad company, it having secured the control of a greater mileage of lines than any other company in the world. The investigating committee of 1874 have expressed this view as follows:

"Experience in the West has demonstrated that a railway cannot determine the route or destination of traffic originating on its line, and certainly has no controlling influence over trade at competitive points. Elements independent of the way of carriage first determine the destination of freight. After that, questions as to speed, safety, rates, etc., fix the route. With so many competitive points in the West the railway companies recognize their true interests in furnishing every facility to the shipper of freight, and do not attempt by possible hindrances or undue charges to defeat his interests, resulting as it would to the injury of the railway companies."

There is reason to believe that the managers of certain of the great railroad organizations of the country, in attempting to carry out their ambitious policy of railroad extension, failed to foresee the fact that they were creating competitive agencies more rapidly than they were gaining control over commerce.

[TO BE CONTINUED.]

## The Baltimore & Ohio Strike.

The following order was issued by President Garrett on July 12: "To the officers and employees of the Baltimore & Ohio Railroad Company: At a meeting of the board of the directors of the Baltimore & Ohio Railroad Company, held this day, the following preamble and resolutions were adopted:

"WHEREAS, The depression in the general business interests of the country continues, thus seriously affecting the usual earnings of railway companies, and rendering a further reduction of expenses necessary; therefore, be it

"Resolved, That a reduction of 10 per cent. be made in the present compensation of all officers and employees, of every grade, in the service of the company, where the amount received exceeds one dollar per day, to take effect on and after July 16, instant.

"Resolved, That the said reduction shall apply to the main stem and branches east of the Ohio River, and the trans-Ohio divisions, and that it shall embrace all roads leased or operated by the Baltimore & Ohio Railroad Company.

"It is hoped and believed that all persons in the service of the company will appreciate the necessity of and concur cordially in this action.

"The board postponed action until some time after its great competitors, the Pennsylvania, New York Central & Hudson River and Erie companies had made general and similar reductions in pay, with the hope that business would so improve that this necessity would be obviated. In this they have been disappointed. The President, in announcing the decision of the board, takes occasion to express the conviction and expectation that every officer and man in the service will cheerfully recognize the necessity of the reduction, and earnestly co-operate in every measure of judicious economy, necessary to aid in maintaining effectively the usefulness and success of the company."

Most of the employees have submitted quietly to the reduction, but the locomotive firemen resolved to quit work. On July 16 a number of them did so at Baltimore and were followed by some of the freight brakemen. They were quickly paid off and discharged, but a large crowd of them gathered at Camden Junction, where they endeavored to prevent the passage of freight trains. They were, however, dispersed by the city police and no further serious disturbance has occurred at Baltimore, though a threatening crowd is still hanging about the yards.

Further out on the line the strike was more formidable. There, as in Baltimore, the freight brakemen joined the firemen, and at the division stations, Keyser, Martinsburg and Grafton, they drove the new men hired by the company from their posts and put a stop to all movement of freight trains. Martinsburg appears to be the central point of the strike, most of the men being gathered at that point. A local militia company was ordered out by the West Virginia authorities, but proved entirely unable to cope with the mob, and an attempt to start a freight train proved unsuccessful, after some shots had been fired and two men hurt. At Keyser and Grafton there was less trouble, probably because little effort was made to start trains there, which would be useless until the blockade at Martinsburg was broken. An appeal was made by the company to the Governor of West Virginia for assistance, and several companies of militia have been ordered out.

At latest dates (July 18) the situation appears to be that passenger trains are running, though the strikers threaten to stop them also; all movement of freight over the road is stopped, and the West Virginia troops are on their way to Martinsburg to enforce order there. None of the other employees have shown any disposition to join the firemen and brakemen in the strike.





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## Editorial Announcements.

**Passes.**—All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.

**Addresses.**—Business letters should be addressed and drafts made payable to THE RAILROAD GAZETTE. Communications for the attention of the Editors should be addressed EDITOR RAILROAD GAZETTE.

**Advertisements.**—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

**Contributions.**—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particularly as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

## COUPLING CARS.

The discussion of this subject at the Master Car-Builders' Convention, a report of which we published last week, should have the effect of directing the attention of railroad managers and car-builders to it, and thus lead to a thorough investigation of the causes of the great danger which, it is said, attends the coupling of cars. If some one should take the trouble to collect statistics of the accidents which now occur from this cause, it would present such an array of suffering as should at once arrest the attention of the public, and compel railroad managers to give greater protection to the lives and limbs of their employees.

Hardly anything more pathetic can be imagined than the appeal of the committee of the Yardmasters' Association to the President of the Master Car Builders' Association, to provide better protection for the men engaged in coupling cars. The yardmasters are situated better than any one else to see the danger to which the men in their employ are exposed. In some localities accidents occur at least weekly if not daily. They are attended, too, with the most horrible and excruciating bodily pain and suffering, and are followed often by helplessness and want, both to the sufferer and those who are dependent upon him. The appeal of the yardmasters is the first organized effort which has been made by the class who suffer most to obtain some relief, and, considering how much they have to complain about, their appeal has been a very mild one. To quote from the discussion already referred to: "Mr. Garey said that the Yardmasters' Committee told him that they did not want self-couplers, but only some arrangement by which a man could be sure he would not be crushed when he went between two cars to couple them." They also asked that the Car-Builders' Association should do all in its power to secure a uniform height of draw-bar. As the latter Association has already recommended a standard height for draw-bars, it has done all in its power to bring this about. It remains for those higher in authority to authorize or order the adoption of this standard.

The chief cause of complaint and of condemnation during the discussion was what have been called the "man-

killers" which are much used on some lines. These are cast-iron or wooden blocks, of which one is placed on each side of the draw-head, and in such a position that a man is obliged to reach either over or under them in coupling or uncoupling cars. He is thus obliged to assume a very awkward attitude, and one in which it is difficult to protect himself from accident or see the position of the draw-head or of the link and pin. The Yardmasters' Committee uttered a special protest against the use of these "man-killers." Unfortunately, owing to a confusion of terms, "dead-wood" was sometimes used during the discussion to mean the "man-killers," and sometimes a wooden block which is placed over the top of the draw-bar for the same purpose. The meaning of the remarks of those who took part in the debate is therefore at times obscure. There were, however, a number of members of the Car-Builders' Association who defended the use of the "man-killers," notwithstanding the denunciation of their use by the majority of those who took part in the discussion. As the defenders were men of experience and ability, their opinions should of course receive due consideration, but we cannot help but feel that the earnest appeal of the yardmasters, that the "man-killers" should be reformed out of existence, is deserving of full as much, if not more, consideration than that of any one else.

We do not intend here to decide who was right or which form of construction provides the greatest amount of safety, but we wish to present the appeal of the yardmasters to railroad managers in the strongest way we can. They have come and have in effect said to railroad managers, Our comrades are being maimed and crushed and killed by hundreds and thousands by the cars which you employ us to couple. One of the chief causes of the danger to which we are exposed is the use of the "man-killers." Now we appeal to you to do what is in your power to diminish the danger. Place the draw-bars at a uniform height, and "give us some arrangement by which a man can be sure he will not be crushed when he goes between two cars to couple them."

Now, whether these men are right or wrong in condemning the "man-killers,"—and it should be remembered that they are supported in their condemnation by a majority of the master car-builders who took part in the discussion of this subject, among whom was the President of the Association and some of the ablest and most experienced of the members—their appeal should not only merit but should demand a hearing and full consideration. To refuse it, and to continue the use of appliances dangerous to life and limb, which would appear to be so if the appeal had received due consideration, places those who turn a deaf ear in a position in which they may at any time be, at least morally, guilty of manslaughter.

It is not intended here to convey the idea that railroad managers as a rule are indifferent to the loss of life or limb of their employees. Occasionally some story is related, like that of the Superintendent who said that men were cheaper than improved coupling arrangements, and of another who remarked that if one man was hurt there were plenty others to take his place. People who hold such sentiments should be driven out of civilized society. The reason why so many railroad managers are apparently at least indifferent about the construction of their cars is that their attention has never been specially called to the subject. When a man is killed or seriously hurt, he disappears from society, and unless his friends bring suit for damages there is no investigation of the causes of his injury, and it may always be more conveniently attributed to his own carelessness than to any other cause. Then, too, considering the fact that there are now a thousand or more patents on self-couplers and none of them, excepting Miller's, in anything like common use, it must be said that it is rather hopeless for a railroad manager to seek for a remedy for the evil from this source. We confess to a want of faith in self-coupling arrangements. To say that it is impossible to make an effective self-coupler would of course be unwise, because it is impossible to prove a negative, but probably the reason why means have not been adopted to protect those who couple cars is that the remedies proposed do not seem to be effective. Now in this matter it seems probable that more could be accomplished by improvements than by reform. If the present form of car construction was modified, so that men would be relieved from some of the dangers to which they are now exposed, it would certainly diminish the number of accidents, if it would not entirely eradicate the evil. Now the improvements to which the attention of railroad managers might be directed are, besides those already referred to, an increase in the strength of the draw-bar and the buffing arrangements. The use of an auxiliary buffing spring has been very successful on the New York Central Railroad. It has also been observed that a frequent cause of accident is the crushing of men's hands in attempting to draw coupling pins if the engine is backing up at the same time. The draw-heads are then compressed, and the man's hand is caught between the pin and the deadwood. A stop of some kind could be used on the draw-bar, which

would limit the distance to which the latter could be compressed, and which would thus always allow sufficient room for a man's hand. On the Chicago, Burlington & Quincy Railroad a form of the Potter draw-bar is used, which accomplishes this. We will soon publish an engraving of this.

On some cars, although it is happily comparatively rare now, the outside sills are allowed to project beyond the end timbers. The consequence is that in passing to or from a short switch, these projections on the inside of the curve approach so close to each other that if a person happens to be between them he is certain to be crushed. The practice of the Baltimore & Ohio and some other railroads, of framing an end timber to the longitudinal sills so that it projects beyond or outside of the end of the car body, and then tapering it from the centre to the outside ends, so that the space between the cars on the outside is always greater than near the centre, seems to be a very excellent one, and gives great strength to the frame of the car to resist concussions.

To place any sort of obstacle in the way of seeing or reaching the draw-bar increases the danger of coupling.

Accidents are caused sometimes—how frequently we are not able to say—from the men catching their boots in frogs or guard rails and thus becoming fastened before an advancing car until they are thus run over. Their struggles to free themselves are liable only to secure them the more hopelessly; and hardly anything more horrible can be imagined than such a fate. The only remedy proposed for this danger is to fill up the space between the guard and main rails or in the frog with wood, so that there is only room for the flanges of the wheels and not enough for a man's foot, so that he would not be liable to be caught in this way.

These suggestions are not intended to cover all the sources of danger, nor would the adoption of them probably remedy as much of the evil as it is possible to remedy; but if we can induce those in authority to investigate the subject, they will then doubtless be able to accomplish very much more than it is possible for us to suggest even. Our plea is for human life and limb, which railroad companies have no right to expose needlessly to danger; and although corporations are soulless, their superintendents, master mechanics and car-builders are not, and therefore our appeal is to those officers and not to the corporations.

## An Indian Example for American Managers.

"Blocked with traffic" is a complaint not often heard in this country recently, but it seems that there is at least one railroad in the world which has more than it can do. The *Indian Railway Service Gazette* of May 12 says: "The block on the East Indian Railway has become something truly serious. It is difficult to convey the least idea of the loss and inconvenience sustained by traders in produce, and still more difficult to picture the confusion at the many stations between Calcutta and Delhi, a distance of 1,000 miles; pile upon pile, mile upon mile, thousands upon thousands of tons of wheat, rice, seeds and other country produce may be reckoned at these numerous stations on the line. This block has existed since December last, and there is little hope of any relief till the end of the current year."

By the way, this railroad makes a favorable comparison with American trunk lines even in the cost of transportation. Indian railroads, unlike English ones, report the receipt and expense per ton and per passenger per mile. The expense per ton per mile on the East Indian was but 0.251d., on 0.502 cent, during the last half of 1876. This is just about equal to the lowest average rate reported by an American railroad for 1876 (0.504 cent, on the Philadelphia & Erie). No allowance is to be made for the depreciation of our currency, for the Indian currency is not gold but exclusively silver, which was certainly not worth more than American currency at the time. Regarding the circumstances affecting the cost of Indian railways, and of the East Indian in particular, the *Indian Railway Service Gazette* says that the East Indian holds an exceptional position, commanding a much larger traffic than any other, and able to haul far greater loads in a train, while it has a large coal traffic and cheap fuel. Further, this paper says: "Grain, we are aware, is carried over immense lengths, and at very low rates, on the American lines, and yet for every one employed they pay at least twice, and in many cases three to five times the rates paid by any Indian railway for the same classes of labor; all, excepting managers and leading officials, receive higher salaries than the average rates paid in India. Yet American lines carry at lower rates; but the labor-saving appliances, and the intelligence, brought into requisition on the American lines, is, we are aware, far superior to that obtained in India." As this railroad makes a good net income, an English railroad journal cites it as an example for American railroad managers, claiming that if they were as honest, skillful and economical as the Indian managers they would make a grand income for the roads which now do not pay. It neglects to consider, however, that though the East Indian has light expenses, it has too what our trunk lines would call high rates, namely, 1.76 cents



per ton per mile; and while its expenses are but 34 per cent. of its receipts, those of the Philadelphia Erie, though about the same in amount, are 65 per cent. of its receipts. If the Erie Railway, concerning which English complaints are loudest, had received as high a rate of freight as the East Indian in 1876, without any decrease in expenses, its net earnings would have been greater than they actually were by no less than \$7,500,000—equivalent to about nine per cent. on its enormous share capital, and with that rate of receipt the proportion of expenses to earnings would have been 50 per cent. instead of 88 per cent.—which latter is much complained of. So the Atlantic & Great Western would have had \$2,600,000 more net earnings if it had received the East Indian rate of 1.76 cents per ton per mile, instead of the 0.906 cent which it actually did receive, and in that case its working expenses for freight traffic would have been 44 per cent. instead of 85½ per cent.—which former probably would have been regarded as very low. American railroads such as these need fear a comparison with no others in the world, so far as the expenses of freight traffic are concerned, and least of all with English railroads. But if those who discuss the matter in England would take account of the rate received, as well as of the percentage of expenses, we would more frequently get due credit for our good work.

#### The Internal Commerce Report.

The Report on Internal Commerce just issued by the Bureau of Statistics is the first ever published. One of the results of the Windom Senate Committee on Transportation Lines to the Seaboard was the establishment of a "Division of Internal Commerce" in the Bureau of Statistics, with Mr. Joseph Nimmo, Jr., as its Chief. It was intended, we believe, to make this chiefly a statistical bureau, to collect and publish information as to the internal commercial movements of the country—a work of the very highest importance, which might be made of practical value to almost every man in the country—farmers, manufacturers, carriers, merchants and all; but to do anything like satisfactory work of this kind, a considerable force and some legislation are necessary, for the information needed cannot be had for the asking and cannot be compiled into shape available for common use without a considerable force of men. These requisites were not at the command of the official in charge of this department, and the statistics of his report are therefore almost entirely compilations from the reports of commercial organizations, etc. They are, however, very valuable, uniting what cannot be had elsewhere except by the examination of a great many different publications, rarely found collected together, and some of them quite rare.

However, the chief subject considered in this report is transportation, rather than commerce in general; and a novel plan has been followed in the discussion of this question. The division obtained from experts reports on certain subjects: thus Mr. Albert Fink gives a paper which makes quite a volume on "The Commercial Movements between the Western and South Atlantic and Gulf States, the Economy of Transport on Rail and Water Lines, and the Competition between Markets and between Transportation Lines"—a work of remarkable ability on a subject heretofore little written about. There follows another very interesting paper by Mr. J. D. Hayes, formerly Manager of the Blue Line, on "The Commerce between the Western States and the States on the Atlantic Seaboard, and the Various Interior Lines of Transport by Lake and Rail between the West and the Seaboard". There are 44 other papers in the Appendix, which covers 247 pages of fine type, many of them from the officers of commercial organizations in different cities, giving on the whole a very good idea as to what the different commercial communities of the country think on the subject of transportation, and what are the special needs of each. The Appendix really forms the bulk of the book, and it is also the basis of the report proper, many parts of which are substantially compilations from the papers in the Appendix and from other existing publications on the subjects considered. But the result is some extremely valuable papers more general in their nature than the contributions of experts in the Appendix.

One of the sections of the report, that on "The Competitive Forces which Exert an Influence over the Internal Commerce of the United States," we begin to publish this week. No so general a study of the subject has ever been published before, and it should receive the attention of all traffic managers. Indeed, nearly every thing the book will be found of great interest to all engaged in transportation business.

#### Boston Railroad Projects.

The usual number of plans for utilizing the Hoosac Tunnel are under discussion in Boston, with some fresh additions. The latest and most comprehensive plan is the organization of a new company to take in the Fitchburg and Gen. Burt's Boston, Hoosac Tunnel & Western Company. The plan is to use the existing lines to near the Hudson River, cross that river on Gen. Burt's line and run to Schenectady and thence west

through Utica and Auburn, using from the latter place the line surveyed some years ago for the New York & Oswego Midland's Western Extension. Connection with the anthracite coal regions is to be made over the Albany & Susquehanna from Schenectady and with the bituminous coal regions of Northwest Pennsylvania over the Utica, Ithaca & Elmira. It is proposed to give the Fitchburg and Vermont & Massachusetts stockholders preferred stock and to raise \$15,000,000 new capital, of which the city of Boston is to contribute \$5,000,000, Boston capitalists \$5,000,000, and English parties interested in the Great Western of Canada and the Atlantic & Great Western the other \$5,000,000. Grand Trunk stockholders are also mentioned as possible subscribers, though why they should contribute to build up a new competitor for the business of a large part of their line it is hard to see.

This plan also includes the old project of tunneling Beacon Hill and improving the South Boston flats as a railroad terminus and for steamer docks and elevators.

The Massachusetts Central is also talked of as a line to the tunnel, but its existing encumbrances do not seem to be easy to dispose of. The Matthews bonds can or possibly have been bought up for a small amount, but President Stone is said to hold some \$1,700,000 of unissued bonds, which he threatens to put upon the market if any attempt is made to take the control away from him. Further, nobody seems disposed to contribute the \$1,500,000 needed to finish the road, and there might be difficulty in securing connections west of the tunnel.

The New York & New England also comes forward as a Western line, although it does not connect with the Tunnel Line. The committee appointed by the late Legislature to sit during the recess are having hearings as to the condition of the road and its probable value. It will take about \$1,600,000 to complete the Hartford, Providence & Fishkill road to the Hudson River, and it is now proposed, if the money can be had, to abandon part of the graded line to Fishkill and make the western terminus at Poughkeepsie to secure the bridge connection and compete with the Connecticut Western for any business that may come that way. In the present state of public opinion, however, it does not seem likely that the State will put any more money in this line, preferring rather to run the risk of losing what it has already invested.

The latest plan brought forward in the interest of Boston is for the State to buy the Boston & Albany and work it as a State road. The charter of the company makes provision for such a purchase, and it is said that the State can get plenty of money at 4 or 4½ per cent. and could certainly get a profit from the road. This plan can hardly be said to have much backing, however, and is not likely to amount to anything more than talk.

Lastly the narrow-gauge people are talking of a system of narrow-gauge lines to connect Boston with Providence, Portland and Montreal, Brattleboro, Rutland and Lake Champlain and the Hudson River. Presently they will take in New York, Washington, New Orleans, Chicago, St. Louis, Omaha and San Francisco, to the final superseding of all standard gauge lines. Their present plans include the completion of the Massachusetts Central as a narrow-gauge line and its extension from Northampton to Poughkeepsie.

#### The Baltimore & Ohio Strike.

The freight brakemen and firemen of the Baltimore & Ohio Railroad were not content with refusing to work at the reduced wages offered them, which of course they had a right to do, but they have assumed to determine that no one else shall, and in carrying out their determination they have had resort to violence, actually waging open war on the company and also on the State authorities sent to protect the company in its rights. They have thus made themselves public enemies, to be pursued, apprehended and punished as such, and it is to be hoped that the force which the State is bringing to bear upon them may not only rescue the company and its new employees from the dictation of these violent strikers, but do it promptly, and bring the latter to condign punishment. The community cannot afford to let these men go unpunished. They have made themselves criminals deliberately, and it must be made plain that such attempts as they have made shall not only be frustrated, but punished.

The strike is limited to the freight firemen and freight brakemen. The reduction in their wages was 10 per cent., which is the same that has been made recently on most railroads, and has been everywhere submitted to, we believe, though there were grave fears on the Erie two weeks ago that there would be a strike and the practice of violence. Of course the reduction is likely to be felt most when wages were lowest beforehand, for there is no uniform scale of wages for such services. We give below the daily wages paid in April or May last to firemen and brakemen on freight trains on seven important Eastern lines, including the Baltimore & Ohio. On every one of these lines, we believe, there has been since a reduction, generally 10 per cent. On some of these roads wages are paid by the month, but in these cases they have been reduced at the rate of 26 working days per month, for the purpose of easy comparison:

Eastern Railroads.	Wages of Freight Firemen and Brakemen in April and May, on Seven Eastern Railroads.			
	Firemen.		Brakemen.	
Baltimore & Ohio.....	\$1 50 and \$1 75		\$1 50 and \$1 75	
Philadelphia, Wil. & Baltimore.....	1 73 "	2 00	1 73 "	1 92
Phila. & Erie.....	\$2 00, 2 30 "	2 50	....	....
Penna., N. J. Div.....	1 90, 2 00 "	2 10	....	....
Erie.....	\$1 76, 2 12, 2 24 "	2 36	1 75 "	2 00
New York Cent. & Hudson River.....	1 25, 1 50 "	1 75	1 65 "	2 15
N. Y., New Haven & Hartford.....	1 73 "	1 90	1 56	....

The wages on the Baltimore & Ohio were lower than the average, but for firemen no lower than on the New York Central & Hudson River, and for the lowest class not so low, and for the brakemen considerably higher than on the New York, New Haven & Hartford. The reduction brings down their

wages (on the Baltimore & Ohio) to \$1.35 and \$1.58, against \$1.12½, \$1.35 and \$1.58 for firemen and \$1.49 and \$1.94 for brakemen on the New York Central.

A day's work varies on different roads, and consideration of this is usually taken in fixing the wages. The day's run for these men is reported at 100 miles on the Baltimore & Ohio, at 100 for firemen and 150 for brakemen on the New York Central, generally a little less than 100 on the Erie, and in some cases as low as 74 miles.

Of course no amount of reduction could justify the acts of the Baltimore & Ohio strikers in their conduct in virtually declaring war upon the company and the community. But it is interesting to know just how great the reduction is and what wages the men are asked to accept. The wages amount to \$421 and \$493 per year for the two grades, and the reduction is \$47 and \$53.

#### The Portland & Ogdensburg Completed.

The last rail on the Vermont Division was laid July 17, thus completing, after many delays, the line across Vermont from Lunenburg on the Connecticut River to Swanton on Lake Champlain, 115 miles, and, in connection with the road owned by the Maine company, a line from Portland to Swanton, 229 miles long. It has also a connection with Burlington, Vt., by the lately-completed Burlington & Lamoille road, from Cambridge to Burlington. Much ballasting and finishing are still to be done and trains will not run through for several weeks.

The Vermont Division is owned by three separate companies, the St. Johnsbury, the Essex County and the Lamoille Valley, which are united by a partial consolidation and have issued bonds under a joint mortgage covering the whole line. The completion of the road has been delayed chiefly by the difficulty of raising money, and it is said that some of the work has been done in a hasty and incomplete manner. Doubtless much still remains to be done to make it a good road.

The line was projected to connect Portland with Lake Champlain at its northern end and also with the navigation of the lakes at Ogdensburg on the St. Lawrence. The latter object is to be attained by a connection from Swanton to the Ogdensburg & Lake Champlain road. A Montreal connection is also projected over the Montreal, Portland & Boston road, now under construction. The original projectors hoped to bring a great through traffic to Portland over the road, besides a considerable local business from Vermont and New Hampshire. These expectations are hardly likely to be realized. As a through line the road has the disadvantage of very heavy grades through the White Mountains in New Hampshire and the Walden Ridge in Eastern Vermont. Locally, the country served has not a very heavy business; there are few manufacturing towns of any size on the line, and it must meet the competition of the older lines leading southward and south-eastward to New York and Boston.

#### Atlantic Grain Receipts.

The receipts of grain of all kinds at the different Atlantic ports for the twelve weeks since navigation opened, from April 15 to July 7, were as follows:

	1877.			
	Bushels.	P. c.	Bushels.	P. c.
New York.....	13,037,938	42.2	22,616,324	44.5
Boston.....	2,365,017	7.7	3,885,296	7.6
Portland.....	190,064	0.6	565,718	1.1
Montreal.....	2,815,230	9.1	4,732,777	9.3
Philadelphia.....	4,027,990	13.0	10,005,950	19.6
Baltimore.....	6,218,190	20.1	7,499,335	14.7
New Orleans.....	2,268,727	7.3	1,634,189	3.2
Total.....	30,924,156	100.0	50,990,589	100.0

The decrease in the aggregate seaboard receipts has been nearly 40 per cent., amounting to 20,000,000 bushels. All ports show a decrease, but the changes in proportions have been simply these: a loss of 2.3 per cent. at New York, 0.5 at Portland, 0.2 at Montreal and 6.6 at Philadelphia; and a gain of 0.1 at Boston, 5.4 at Baltimore and 4.1 at New Orleans. The Baltimore and Philadelphia have about changed places, but the two together have received nearly as large a proportion as they did last year—33.1 against 34.3.

The places which receive largely or chiefly by water are New York, Montreal and New Orleans. These together received 58.6 per cent. of the total this year, against 57.0 per cent. last—an insignificant change.

#### Record of New Railroad Construction.

This number of the *Railroad Gazette* has information of the laying of track on new railroads as follows:

**Portland & Ogdensburg.**—The Vermont Division is completed by laying track from Cambridge, Vt., northeast to East Fairfield, 7 miles.

**Rhode Island & Massachusetts.**—Track laid from Franklin, Mass., south to Valley Falls, R. I., 14 miles, completing the road.

This is a total of 21 miles of new railroad, making 710 miles completed in the United States in 1877, against 846 reported for the corresponding period in 1876, 457 in 1875, 727 in 1874, and 1,578 in 1873.

MECHANICAL ENGINEERS seem to be better appreciated on English railroads than on ours. In connection with a notice of the appointment of a successor to Mr. Joseph Armstrong, late Chief Locomotive Superintendent of the Great Western Railway, it is stated that the salary of the position is £1,500 a year—equivalent to a little more than \$7,500 in our currency. Moreover, after Mr. Armstrong's death, the company voted his widow a gratuity of £1,000. No master mechanic in the United States, it is safe to say, gets a salary anything like this. Very likely, too, some of our roads would be better off if they had a \$7,500 man at the head of their mechanical department—if they could find one. Certainly it cannot be expected that the best talent will devote itself to or remain in this department (where first-class ability is so much needed), unless it offers some great prizes as well as many little ones. Too many railroad companies seem to regard master mechanics as intelligent



blacksmiths, who ought to know how tools are used but have no great need of brains or education. They are not, in the long run, likely to get much better material than they ask for—and pay for.

THE ERIE & NORTH SHORE DISPATCH was organized last year to take the place of some four or five fast freight lines working between New York and Chicago and Milwaukee over the Erie Railway, the three different Canadian railroads between Niagara River and Michigan, and the Michigan Central and Detroit & Milwaukee railroads. Each of these lines had an organization to maintain, and soliciting agencies in New York and Chicago or Milwaukee, which for the limited traffic obtainable made a serious addition to the expense of carrying it. The consolidation was made by dividing future business on the basis of the results of past years. The managers of the line met in Detroit last week, when it was reported that the business of the line, notwithstanding the great reduction of the soliciting force effected by the consolidation, had been a little greater for the six months after consolidation than that of the several lines for the six months before; while in the expenses there had been a saving of \$27,000, and a prospect of a further saving of \$50,000 in the next six months.

THE FRESH MEAT EXPORTS for the first half of the year were 24,083 tons this year against 9,995 tons last year, the increase being 141 per cent. This year 75 per cent. of these exports were made from New York and nearly all the rest from Philadelphia. This year also 6,220 head of cattle and 5,080 of sheep were exported. This does not make much impression on our cattle supply, and is promising chiefly as a beginning.

WATER RATES have been maintained firmly during the past week, and Tuesday were reported higher—2½ cents per bushel for corn from Chicago to Buffalo and 4½ from Buffalo to New York—which is ½ cents more in each case than the lowest rates of the season. Lake rates are now higher than at this time last year, and canal rates just about as high, aside from the reduction in tolls.

CHICAGO-BOSTON RATES were not made the same as Chicago-New York rates by the tariff of July 2, as was reported by telegraph, but the usual difference of five cents per 100 lbs. on all the lower classes in favor of New York was preserved.

## Contributions.

### Railroad Ticket Accounts.

(From a forthcoming work entitled "Railway Revenue and its Collection," soon to be published.)

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At once upon the receipt of the monthly returns from agents and others the work of examining the same begins, and proceeds thereafter with unflagging industry until everything in relation to the same has been carefully scrutinized.

The processes to which these returns are submitted cannot be described. They are subjected, like the returns received by other departments, to the most laborious analysis, being examined and re-examined, sifted and compared, checked and counter-checked, footed and refooted, before being finally recorded.

In reference to the returns for tickets sold, all reports from agents should reach the ticket department by the 3d of the month.

Immediately upon the discovery of an error in the returns for tickets sold, a notice of the same should be forwarded to the agent or company making the mistake, and, in the case of foreign roads, asking when the mistake will be corrected.

All returns for tickets sold, whether made by agents or foreign railway companies, are carefully compared with the tickets actually collected.

The tickets returned frequently fall short of the number reported, the tickets being lost or remaining in the possession of the purchaser. No loss can, of course, accrue to the company through agents from the loss of the tickets sold, for the reason that the tickets furnished to agents are all consecutively numbered, and agents are required so to account for them in their returns.

It should be understood that when the word *local* is used in connection with coupon ticket returns, it does not signify that they are exclusively local tickets. They are not. On the contrary, the coupons attached are for use on other roads, as they specify upon their face. The word *local* is used to distinguish them from the same class of tickets sold by other companies; the latter being called *foreign* coupon tickets. For all local coupon tickets sold the different railway companies interested, i. e., the lines over which they are sold, are notified each month in detail of the proportions due them by the company issuing the tickets. In return, such company receives a report from the different roads of the *foreign* tickets sold over its lines. It is common to designate the lines selling these last-mentioned tickets as "*foreign* lines."

### RECORDS AND REPORTS MADE IN GENERAL TICKET DEPARTMENT.

As soon as the local coupon returns (the monthly coupon ticket reports) have been examined, they are entered in detail upon the "Record Book and Division of Coupon Tickets Sold." The rate or proportion due the several lines is entered in the place provided; the amounts due the companies are then entered. When all the extensions have been made, the book is footed (fifty pages sometimes being required for recording the business of one month). The aggregate amount due the several companies, including the proportion of the company issuing the tickets, should correspond exactly with the aggregate amount of local coupon ticket sales, and the fact of such perfect balance is presumptive evidence of the correctness of the extensions and footings.

As soon as the total amounts due to the various companies for and on account of local coupon tickets are ascertained, the

amount due to each company should be forthwith reported to the Local Treasurer for entry upon the general journal and ledger. In making these returns the amounts should be entered in "Railway Companies' Ticket Journal."

As soon as the total amounts have been reported to the accounting officer as described, the work of making detailed reports of the local coupon tickets sold should proceed without interruption.

The report in question is identical in many respects with the division book. It states:

- 1st. The point from which the ticket was sold.
- 2d. The place to which the ticket was sold.
- 3d. The form. (The form number indicates the particular route of the ticket; each route being provided with a different form number.)
- 4th. The commencing number of the tickets sold; the closing number of the tickets sold. (The difference between the commencing number and the closing number is the number sold.)
- 5th. The through rate; the proportion of such rate belonging to the particular company to which the report is sent; and, finally, the total amount due such company for all tickets sold between the points from and to already described. Adding up these various amounts gives the total amount due to the company already shown on the distribution book.

When the reports in question are completed, no delay should occur in forwarding them to the different roads for which they are made, so that the least possible delay may be occasioned other companies in writing up their books, and so that the balances may be promptly adjusted. These reports, if due diligence is observed, should be ready for mailing by the twenty-fifth of the month; never later than the thirtieth.

The data required in making the extensions on the "record book and division of coupon tickets" are arrived at in various ways. The route of the ticket is indicated by the form number. By referring to the "Record Book of Forms," the various lines are found named and in the order in which the coupons were attached to the ticket.

There are various ways for determining the division of earnings to be allotted the different lines over which a coupon ticket passes. Sometimes it is done by arbitration; sometimes it is pro-rated or based upon the mileage of the several lines; sometimes upon the local tariff in force; sometimes upon arbitrary arrangement, the amount of the business done, and in various other ways.

All the vicissitudes of the traffic have to be considered in making the through rate. After the through rate is determined upon, the proportion to be allotted to the several lines performing the service is of course a matter of agreement between such lines. But the divisions are constantly changing, so that it requires the utmost vigilance and care to divide the joint business between the lines interested upon the basis agreed upon and understood and accepted by such lines.

In reference to the earnings from local coupon tickets, it may be said that the amount charged to agents on account of the sale of local coupon tickets is of course in excess of the amount credited to foreign lines for their proportion of the sale of such tickets. This excess is the earnings of the company issuing the local coupon tickets, and such excess should be credited to passenger earnings.

In the case of local ticket sales and fares collected by conductors, the entry on the general books is extremely simple, consisting of a debit and credit entry, "*Agents and Conductors*" being charged and "*Passenger Earnings*" credited. The foreign coupons should be credited to earnings in the month in which they are collected by conductors; the manner in which this may be done is described quite fully in Chapter IX.

The foreign coupon tickets collected should be arranged in packages according to the months in which they were sold, as indicated by the date stamped upon each; they should then be again subdivided, the tickets having the same destination and route, i. e., the same form numbers being collected together. The number of tickets of each form should then be entered in the "Record Book of Foreign Coupons."

Upon receipt of the report from the company issuing the tickets, the number of tickets actually reported sold of each form by the company should be entered in the "Record Book of Foreign Coupons" opposite the number of tickets collected as entered therein. In this way a permanent record is provided, and any discrepancy of tickets between the tickets collected and the tickets reported would elicit instant attention and investigation.

Immediately upon receipt of a report from a foreign company a memorandum of the amount of such report should forthwith be certified to the Local Treasurer, to enable him to ascertain without delay the nature of the balance of the account between the two roads for the month for which the report is made, so that if it is a debit balance the amount may be drawn for without delay, or if the balance is on the opposite side of the ledger, the draft of the company may be honored upon presentation.

The difference between the amount due from a company for its sales over a foreign line during any one month and the amount due to it for the sale of the foreign line for the corresponding month constitute the balance; this balance is at all times subject to draft at sight.

At the close of the month the amount due from each foreign company, as shown by the reports received from such companies during the month, should be entered opposite the name of the road interested, in the "Railway Companies' Ticket Journal," so that it may be formally posted up on the general books by the accounting officer.

For the purpose of preventing misunderstanding and confusion in the accounts between companies, no changes whatever are, by common consent, ever made in a company's report of its sales over other lines. A record is made of all mistakes or omissions that may be discovered, and the company in fault is officially notified. This notice is coupled with a request to

make the necessary corrections in the next succeeding report. When there is an omission to report tickets, the tickets omitted should be temporarily returned, for purposes of examination, to the company issuing them. As no alterations are ever made in the local coupon reports that the companies send out, it follows that the various items or accounts as entered up by the various lines throughout the country always agree exactly.

The gross balance (i. e., taking the aggregate of all the items entered) appearing upon the books, as between any two companies that may be named, will never of course agree at any particular time. For instance, on the 31st of January, as shown by the books, railway A credits railway B for tickets sold over the latter in January; no report is received, however, by it for the tickets sold by B until too late to include in January account; consequently the aggregate balances on the 31st of January do not agree on the books of the respective companies.

The collections for extra baggage for and on account of other companies are usually itemized and embraced in the report of coupon ticket sales for the month in which the collections were made.

Receipts from extra baggage, as already stated, are credited to "Miscellaneous Earnings."

In reference to the collections of agents for local tickets sold by them: After the reports have been examined and audited, the aggregate amount due from each agent is certified to the accounting officer upon the "Agents' Ticket Journal."

In the same manner the total amount of each conductor's collections for the month is certified to the Local Treasurer, and for this purpose the "Conductors' Journal" is provided.

The total amount of the daily trip reports of conductors should be methodically recorded by the ticket accountant, so that in the event the aggregate amount charged to conductors, as shown by the Conductors' Journal, does not agree with the amount of cash remitted by the conductor, the account may be expeditiously examined in the treasury department.

The "Station Agents' Ticket Journal" and the "Conductors' Journal" can be arranged so as to require but one book, i. e., a part of the book can be apportioned to and arranged for the former, the other part being used for the latter. This plan for providing for two journals in one volume can be observed in other cases where the business is light or the books are likely to multiply too greatly.

The agents' monthly report of extra baggage received and forwarded should reach the accounting office by the 5th of the month.

The statement of the amount reported as collected by agents on account of extra baggage received should be compared as far as possible with the amount reported by the forwarding agent, and with the statement of the extra baggage cards carried forward from preceding months, and finally the amount should tally with the extra baggage cards returned with the report.

A report from train baggagemen of the destination, number and amount of excess baggage cards in transit constitutes a valuable check upon the business.

The amount reported by agents as collected on account of extra baggage destined to points on other roads, and to stations at which there are no agents, should be carefully checked with the way-bills and returns, and should otherwise be surrounded with such safeguards as may be necessary to secure reliability.

The amount due from agents on account of extra baggage, as shown by the monthly reports of the same, after the reports have been carefully examined and audited, should be reported to the accounting officer on the "Agents' Ticket Journal."

The returns which the ticket department are required to make to the accounting officer should be transmitted to that officer on or before the 19th of the month succeeding the month for which the returns are made.

### THE CASH COLLECTIONS OF CONDUCTORS.

The safeguards that are commonly esteemed necessary in connection with the cash collections for fares upon our trains have long occupied the earnest attention of railway officials, more especially, perhaps, those immediately connected with the passenger department.

Many suggestions have been made and many ingenious forms of tickets designed; all sorts of devices have been introduced, but they each and all seemed to involve machinery of a character so elaborate or so expensive as to preclude their general acceptance or introduction, and not likely to be systematically and effectively carried out in the event they were introduced. Assistant conductors or collectors have been employed upon many roads; the police have been called in; hosts of men acting as conductors have been discharged, many of them without doubt unjustly, yet the evil sought to be overcome remains practically undisturbed.

The great desideratum has always been some simple yet efficacious device that would make every passenger who pays his fare to a conductor the unconscious auditor of that conductor's accounts; some system that did not depend for its efficiency upon the willingness or uprightness of the employee; some device whereby the railway company by proper surveillance could determine beyond question whether the fares collected were duly reported; some system that only required that the number of fare collected by the conductor should be counted by the observer, the amount collected being unalterably recorded; a system, in fact, that did not depend upon the oath or the peculiar appliances of the detective.

This device seems happily to have been discovered in a ticket patented by a Mr. Cook and improved and made serviceable by Mr. W. A. Thrall. It seems to be possible to make it a complete check upon the reporting of the exact amount of each fare collected, yet it does not possess any marked or disgusting characteristic that would make its use impossible with a man possessing common self-respect.

### STOP-OVER TICKETS ISSUED BY CONDUCTORS.

The service upon our railways has also long awaited the introduction of a form of "Stop-over Ticket" or check, so simple



in construction, yet so comprehensive in its character as to meet the wants of the most extended line; a ticket (it would perhaps be more proper to call it a check) that could be used in common and without any change whatever upon the different divisions, branches or lines of a railroad; a check that did not necessitate any writing upon the part of the conductor or occupy his time unnecessarily in issuing it; a check so arranged that the department office could keep itself advised of the number and character of such stop-over checks outstanding and, as far as possible, the basis upon which they were issued. A check that seems to answer all these requirements has just been perfected by Mr. Thrall.\* This check is not patented and may be used by such companies as are disposed. It provides for the date it is issued; the number of station from which issued; the number of station to which issued. A road possessing ten thousand stations need use but one form. A stub is attached giving substantially the same information as the check; this stub is detached when the check is issued; it is inclosed to the general office in a separate envelope with the regular passage ticket in exchange for and on account of which the stop-over check was issued.

[TO BE CONTINUED.]

# Mr. Arthur on the Difficulties Between the Indianapolis, Bloomington & Western and its Engineers.

CLEVELAND, Ohio, July 16, 1877.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I read with surprise, in your issue of July 13, an article signed "Railroad," in which the writer accuses me of making false statements relative to the peaceful adjustment of the differences between the officers and engineers of the Indianapolis, Bloomington & Western Railway, which I deny most emphatically, and pronounce the statement, as far as it relates to my action, an absolute falsehood.

The facts of the case are as follows:

Tuesday, July 18, 1876, we received a telegram to meet the General Committee of the Indianapolis, Bloomington & Western Railroad at Indianapolis, on Wednesday, the 19th. In response to their request we took the evening train, arriving there the next morning at 6 o'clock, and met the committee, composed of Bros. W. Webb, J. R. Timpson, R. B. Trenary and A. Thompson, at the Spencer House; received from them a statement of their grievances and the efforts they had made to adjust them without success. Their grievance was a reduction of wages and the removal of the hostlers. After a careful consideration of the whole matter we decided to call upon Mr. Phineas Pease, General Superintendent, and upon being introduced to him we explained our mission, but owing to the absence of Mr. G. B. Wright, the Receiver, he was unable to adjust the matter and asked us to call the next day at ten o'clock. At the appointed time we met and were introduced to G. B. Wright, the Receiver, and H. L. Cooper, the Master Mechanic, and after a somewhat protracted interview an amicable adjustment was effected, satisfactory to all concerned; and thus again the good counsels of the Brotherhood have prevailed and a rupture between the engineers and the company avoided. We were received and treated with the utmost cordiality by each one of the officers, and the best of feeling seemed to exist between them and the brothers; and we hope it may always continue so.

Last December, as "Railroad" says, a reduction of 10 per cent. was ordered. The committee of engineers had an interview with Mr. Wright, but were unable to agree upon any terms of settlement. Finally Mr. Wright informed them that he was willing to submit the case to the General Grievance Committee of the Brotherhood and abide by their decision. Consequently we were sent for, but owing to previous engagements was unable to meet the committee until Jan. 17, 1877. After learning from them what Mr. Wright had promised, we called upon him with the committee. He received us very cordially, but as soon as we informed him that the committee decided he was not justified in making the reduction, he turned upon us in an angry manner and said, "Then you can strike if you want to." I endeavored to reason with him, but he refused to argue the case, and became very much excited. Finding my efforts to conciliate him were of no avail, I remarked: "Mr. Wright, you relieve me of all responsibility if your engineers decide to stop work." He replied in a loud, angry tone: "I hold you wholly responsible for whatever ensues." I said, "All right. I accept the responsibility," and retired from his presence. Returning to the hotel, my advice to the committee was to return to their division and report the result of our interview with Mr. Wright, and if they were still unwilling to submit to the reduction, to notify me and I would submit it to the proper tribunal of the Brotherhood and inform them of the decision rendered. A few days after I returned to Cleveland I received a telegram from Bro. W. Webb, informing me that Superintendent Pease had men at Urbana to take their places, and required an immediate answer from them whether they would or would not agree to work one year at the reduced rates. I telegraphed him: "Keep your situations," which advice they accepted. "Railroad" says a strike was ordered. That is false. I have given you a true statement of the case and am prepared to furnish undeniable proof that what I have stated is true. It has been my constant aim to so conduct myself as to merit the approval of God and honest men. I have no fears of judges, United States marshals, or detectives, and I repeat what I have frequently expressed at public meetings: "If the officers of the roads where strikes have occurred had evinced the same spirit toward us as we have invariably manifested toward them, they would all have been avoided."

\* Frequent reference is made herein to the accomplished railway student and officer, Mr. W. A. Thrall, in connection with the affairs of the passenger traffic department. Mr. Thrall's investigations have contributed much to the simplification and uniformity of the elaborate machinery that is inseparably connected with the passenger business, and he deservedly ranks as one of the ablest, as he is one of the most studious and modest, of our railway officers.

No one regrets more than I do that we were compelled to resort to such means to obtain what we considered good treatment and a compensation commensurate with the arduous service rendered, and I would advise "Railroad," if he has any more statements to make concerning me or any one else, to tell the truth; then he will not be under the painful necessity of withholding his name. No one but a coward would be guilty of so mean and despicable an act as to accuse a man of falsifying without giving him at least an opportunity of knowing the name of his accuser.

P. M. ARTHUR.

## "Nemo's" Query in Train Dispatching.

TO THE EDITOR OF THE RAILROAD GAZETTE:

As regards "Nemo's" "Query in Train Dispatching" in your issue of the 6th, much time might be spent in arguing it pro and con, but it seems to me to have been a good chance to establish a precedent.

I should have given train 3 an order, first, because there seems to have been a case of doubt as to rights of this train, to have brought about this query; second, it was reasonable to argue that this train expired with the old time card, and "Nemo" says no special train could go on the road without an order from the dispatcher.

These questions of doubt come up on all roads, and while not of great importance in this particular case, except on general principles, it is well to establish a precedent that will make all safe in all similar emergencies: he should state whether another train did not run as No. 3 of 17th on new card.

B.

MEMPHIS, Tenn., July 10, 1877.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I noticed in your issue of the 6th, inst., an article headed "Query in Train Dispatching." No. 3 most unquestionably had the right to leave Sherman on the old schedule at 11:47 A. M. and proceed. After twelve o'clock (13 minutes after leaving Sherman) she would run as delayed No. 3, being governed by the new schedule, and would be something over an hour late, but with same right to proceed to Denison that she would have to-day. Opposing trains would have to be governed by the rules regulating the rights of delayed trains, as No. 3 was simply behind time at 12 o'clock.

All trains on the road at 12 o'clock would fall into new schedule, assuming the time of their respective numbers.

B.

## Southern Railway and Steamship Association.

At the convention held in New York June 27, twenty-seven corporations were represented, some of them by several officers. The officers of the Association, Hon. Joseph E. Brown, President; Virgil Powers, General Commissioner; Charles A. Sindall, Secretary, and Milo S. Freeman, Clearing House Agent, were also present.

The following report from the General Commissioner was presented:

### REPORT OF GENERAL COMMISSIONER.

In further explanation of proposition in Circular Letter No. 66, after full investigation and consideration, I would advise that the proposition be changed so as to collect the 25 or other per cent. on all-competitive business—that going north as well as that going south. I find that in some months it would require a very large percentage of the south-bound business to pay the balances of some companies; besides, there will be less liability to abuse of the plan if the deposit is from all business.

The want of confidence in each other of railroad managers and employees, and the disinclination to pay, has been the prime cause of the large balances that have accrued in the past. If payment of balances is secured so that those not getting their proportion of business know certainly that they will get the profit on it in cash at the end of the month, there will be no valid inducement to cut the rates by rebates or otherwise, to get their share of the business. Some, for the prestige of their lines, may continue these practices, but that, no doubt, will be abandoned very soon. Then the transportation lines will get the benefit of full compensation instead of dividing their income with a favored few to the injury of others, at the various competitive points.

I would also advise the adoption of one-half cent per ton per mile on north-bound, and three-fourths of a cent per ton per mile on south-bound business as compensation for carriage, the distance to be computed at an average of the length of the competing lines. As some lines have more than one route a portion of the distance between competitive points, in getting the average distance the shortest route worked by each line between competitive points to be used.

Reducing the amount for carriage will remove another inducement for getting and carrying by any line more than their proportion, thereby removing another cause for rebates, etc.

The adoption and carrying out of these two improvements in our agreement will very soon restore confidence in our railroad management, and restoration of confidence in that, like all other business, will lead to better prosperity. There is no question, if something is not done to produce this, that a very large number of our roads that are now solvent will become bankrupt. This seems a propitious time. The large and powerful incorporations of the North and Northwest that have wasted such immense amounts of money in their competitions (railroad wars) have recently, I learn, concluded to pool their business, and to carry this out are preparing to form an association similar to ours, with Mr. Albert Fink, our former able General Commissioner, at its head. This is a move in the right direction, and I at least wish them every success, as I know it will rebound to their interest as well as that of the public. It certainly is not the interest of any country, State, city or community to have a large non-paying dead capital in their midst. Wherever you find investments generally paying fair returns to the owners you find prosperity.

I contend then that by carrying out the objects of our Association all over the country—by dividing the business fairly, as near as practicable, at all competitive points, paying balances promptly by lines getting more than their portion, and maintaining fair and reasonable rates to both the transportation lines and the public—that a large portion of the proper investments in the railroads and steamships can be made to pay reasonable interest, and that this will bring prosperity to the country sooner than anything else. It will restore confidence not only in railroad investments, but in others, and restored confidence means restored prosperity.

In addition, I renew my recommendation of the appointment of one General Agent at each competitive point, whose duty it shall be to give all desired information as to rates, routes, etc., and at points of shipment of cotton to sign all bills of lading, and as far as practicable, to bring about the division of business agreed upon. If this is done, it would soon be found unnecessary to have so many soliciting agents and the

large and expensive agencies now maintained in the larger Northern cities. The modification or abolition of these would be a large saving. Judging from the imperfect data within my knowledge, I would say the saving in these items alone to the companies named in our Association would not be less than from \$50,000 to \$70,000 per annum.

To carry out the proposition as to deposit, the 25 per cent. to be deposited should be first taken from the rate or amount same as any other arbitrary in the line and put in a column headed (G. C. Deposit) and *pro rata* the balance as now. When the balances are paid from deposits, the remainder, if any, to be paid *pro rata* to the various links in such line, with statement sent to each member or link in the line showing the amount due them. Where it is ascertained that any line is a creditor, and it is not probable that it will become a debtor during the month, the General Commissioner, in his discretion, may refund to that line the amounts paid in without waiting for the making up of the accounts.

The only or principal loss on this arrangement is the interest for about twenty days on amount of deposit, and this principally to creditor companies, as the money deposited by both debtor and creditor companies does not belong to debtor but creditor companies. The creditor companies are richly repaid, however, by better rates fully maintained, and certainty of getting their balances when due.

On cotton, after deducting arbitraries to points beyond Baltimore, Philadelphia, New York and Providence, deduct the per cent. to be deposited to General Commissioner's account and *pro rata* balance. I herewith submit rates of freight on both cotton and merchandise for the consideration of the convention. These rates are low compared with former rates, when there was much more tonnage, but if fully maintained by all, and the tonnage does not further decrease, I believe will give fair income to all.

The increase on income to and from points whose revenue is at present divided by the use of these rates instead of last winter's rates, will be about \$150,000, or 12 per cent.

I would urge that a division of business be made at all competitive points; if this is not done there is great danger of a war of rates all the while. It is impossible to have agreed rates maintained where there is no division. The business of Montgomery, Selma, Rome, Dalton, Chattanooga, Nashville, Memphis, Meridian, Jackson, Mobile, New Orleans, etc., as well as all local stations governed by division of these places should be divided, if not there will be constant suspicion and complaint of reduced or cut rates. I have no doubt a division will be to the interest of all.

Respectfully,  
VIRGIL POWERS, General Commissioner.

Mr. Powers also presented new schedules of rates on south-bound freights and on cotton.

A committee was appointed to consider the recommendation of an amendment to the constitution. This committee, consisting of R. R. Bridgers, W. G. Bacon, W. L. James, L. Murray Ferris, W. L. Trenholm, S. K. Johnson and E. W. Cole, made the following report, which was accepted and adopted unanimously:

### REPORT ON AMENDING CONSTITUTION.

"The committee to whom was referred the recommendations of the General Commissioner, for amendments to the constitution, respectfully submit the following, and recommend its adoption by the convention:

"On all through business, 20 per cent. of the rate charged, or such smaller amount as the General Commissioner may find necessary, shall be reserved to the credit of the General Commissioner, and treated as an arbitrary arising at the terminal point. The railroad or steamship company making the collection shall deposit the same in some safe bank to the credit of the General Commissioner.

"The amount so reserved from each road shall constitute a fund out of which the General Commissioner shall, at the end of each month, make good the balances due from that road on excess of business.

"After providing for settlement of balances, the remainder shall be returned to the contributing roads. If at any time before the end of the month the funds accumulated should appear to be larger than will be necessary with subsequent accumulations to make good such balances, it shall be the duty of the General Commissioner to make an *ad interim* distribution of the estimated surplus.

"That each initial agency shall forward daily to the General Commissioner's office a duplicate of each way-bill to competitive points.

"We further recommend that the following be adopted and incorporated in the rules of the Association:

"The General Commissioner shall appoint, subject to the approval of the lines terminating at Boston, Providence, New York, Philadelphia and Baltimore, one Deputy Commissioner to supervise all through business at those points, with his headquarters in New York.

"The General Commissioner may also appoint at any competing point at the South, with the approval of the lines concerned, one General Agent, to give information, and, if agreed upon, to issue through bills of lading.

"All soliciting agencies are forbidden at any point selected for the location of a General Agent.

"That the rate allowable as cost of carriage to the roads carrying excess of business shall be three-fourths of a cent per ton per mile; distance to be computed upon basis of average length of lines."

Afterwards the last paragraph of this report was amended so as to read: "That excess of business carried shall be allowed for at not exceeding one-half cent per ton per mile actual distances to lines shorter than average distances; and not exceeding one-half cent per ton per mile computed on average distances to lines longer than the average distances."

The Committee on Rates and Classification reported in favor of adopting the tariff of Dec. 20, 1876, on merchandise and specials and cotton, with slight exceptions, and its report was adopted.

The Montgomery & Eufaula Railroad was admitted as a member of the Association, also the East Tennessee, Virginia & Georgia, and authority was given to admit the Atlanta & Charlotte Air Line, and any other company upon application, notice to be given to all members.

The rates adopted were made to go into effect July 1; the deposits, under the amended constitution, are to be made after July.

The regular annual convention will be held in Atlanta, Oct. 3.

## General Railroad News.

### ELECTIONS AND APPOINTMENTS.

**Allegheny, Kennerdell & Clintonville.**—This company was recently organized with the following officers: President, Richard Kennerdell; directors, J. M. Dickey, C. W. Gillfillan, P. R. Gray, J. C. Kennerdell, Thomas M. King, R. G. Lamberton, C. W. Mackey, C. E. Taylor, John W. Welsh.

**Burlington & Southwestern.**—At a meeting held in Burlington, Ia., July 11, the following directors were chosen: T. A. Weakley, J. Chandler, John Severance, St. Joseph, Mo.; W. W. Crapo, W. J. Rotch, Edward Mandell, New Bedford, Mass.; Henry Sayles, Elijah Smith, Prosper W. Smith, Boston.

**Camden, Gloucester & Mt. Ephraim.**—At the annual meeting in Gloucester, N. J., recently, the following directors were chosen: David S. Brown, Samuel Chew, John K. Grubb, Jas. E. Hays, George B. Heyl, Zophar C. Howell, James B. McFar-



land, F. P. Michellon, Henry N. Paul, Wm. Sexton, Henry F. West.

**Chicago & Springfield.**—The first board of directors of this new company, successor to the Gilman Clinton & Springfield, is as follows: J. C. Willing, Chicago; B. F. Ayer, W. T. Ackerman, Hyde Park, Ill.; L. V. F. Randolph, Plainfield, N. J.; Stuyvesant Fish, New York. They are all officers or stockholders of the Illinois Central, which now owns the road.

**Cincinnati, Wabash & Michigan.**—At the annual meeting in Goshen, Ind., July 11, the following directors were chosen: Ezekiah Colwell, C. E. Cowgill, C. Cowgill, A. G. Wells, Wabash, Ind.; J. H. Defrees, Goshen, Ind.; Charles Chapman, Warsaw, Ind.; A. E. Baldwin, Henry Chisholm, W. S. Jones, C. W. Lepper, Henry B. Payne, A. B. Stone, J. H. Wade, Cleveland, O.

**Covington, Columbus & Black Hills.**—In addition to the changes among the officers lately noted, Mr. K. P. Crandall has been appointed Chief Engineer. His office is at Covington, Neb.

**Houston & Texas Central.**—The office of Assistant General Superintendent has been abolished. Mr. M. G. Howe, Chief Engineer, is appointed also Superintendent of the Southern Division.

**Michigan Central.**—The new board has elected Samuel Sloan President; G. F. Talman, Vice President; H. B. Ledyard, General Manager. Messrs. Sloan and Talman are re-elected; Mr. Ledyard has been General Superintendent.

**Mississippi & Black Rivers.**—At the annual meeting in Richmond, P. Q., July 2, the following directors were chosen: J. H. Graham, Philip Mayer, E. Lawrence, J. Frigean, J. M. Brown, L. S. Huntington, J. McManus, J. C. Willard, D. A. Manson. The board elected J. H. Graham President; E. Lawrence, Vice-President; George Williamson, Secretary; J. McManus, Treasurer; Thomas Hart, Superintendent of Construction.

**Montclair & Greenwood Lake.**—Mr. Grinnell Burt is appointed General Manager. He is also President of the Warwick Valley Railroad Company.

**New York, New Haven & Hartford.**—Mr. C. T. Hempstead has been appointed General Ticket Agent, with office in New York. He has been Paymaster for several years.

**North Carolina.**—At the annual meeting in Salisbury, N. C., July 12, the following directors were chosen by the stockholders: H. W. Fries, Moses L. Holmes, T. M. Holt, Dr. R. B. Haywood. The appointment of the State directors was noted last week. Peter Adams, John L. Brown and F. C. Robbins were chosen members of the Financial Committee on behalf of the stockholders.

**Ohio Central.**—Mr. A. W. Scott, of New Lexington, O., has been appointed Receiver.

**Suffolk & Abemarle.**—Hon. Mills L. Eure, of Suffolk, Va., has been chosen President of this new company.

**Wyandotte, Kansas City & Northwestern.**—Mr. A. C. Stiles has been appointed Master Mechanic, in place of Charles Leman, resigned.

#### PERSONAL.

—Major Charles A. Burton has resigned his position as Assistant General Superintendent of the Houston & Texas Central. The office has been abolished.

—Mr. C. T. Hempstead, late Paymaster and now General Ticket Agent of the New York, New Haven & Hartford, was recently presented with a valuable gold watch by the employees of the road.

—Messrs. John King, Jr., and Wm. Keyser, Vice-Presidents of the Baltimore & Ohio, have built at Garrett, Ind., where the shops of the Chicago Division are located, an Episcopal church, for the use of the residents. The building is of brick and has been formally presented to the Episcopal Bishop of Indiana, who dedicated it July 15.

#### TRAFFIC AND EARNINGS.

##### Railroad Earnings.

Earnings for various periods are reported as follows:

Six months ending June 30:	1877.	1876.	Inc. or Dec.	P. c.
Central Pacific.....	\$7,700,000	\$8,026,945	Dec..	\$326,945 4.1
Cleveland, Mt. Vernon & Delaware.....	184,185	184,200	Dec..	15 ..
Denver & Rio Grande.....	302,860	203,589	Inc..	99,301 48.8
Midland, of Canada.....	111,741	125,154	Dec..	13,413 10.7
St. Louis & South-eastern.....	487,080	492,009	Dec..	4,929 10.0
Five months ending May 31:				
Cleveland, Mt. Vernon & Delaware.....	\$148,989	\$150,550	Dec..	1,560 1.0
Net earnings.....	30,866	30,828	Inc..	38 ..
Per cent. of exps.....	79.28	79.29	Dec..	0.01 ..
Denver Pacific.....	126,849			
Net earnings.....	76,944			
Per cent. of exps.....	39.41			
Kansas Pacific.....	1,092,393	1,126,620	Dec..	33,227 2.9
Net earnings.....	442,161	392,721	Inc..	49,440 12.6
Per cent. of exps.....	59.53	65.00	Dec..	5.46 8.5
Nashville, Chattanooga & St. Louis.....	693,554	758,074	Dec..	64,520 8.5
Net earnings.....	273,450	291,092	Dec..	17,642 6.1
Per cent. of exps.....	60.53	61.61	Dec..	1.08 1.8
Pennsylvania.....	73,699	91,683	Dec..	17,984 24.6
Net earnings.....	17,061	32,006	Dec..	14,945 87.7
Per cent. of exps.....	76.54	64.87	Inc..	11.67 18.0
St. Louis, Iron Mt. & Southern.....	1,657,977	1,466,743	Inc..	191,234 13.0
Net earnings.....	692,231	698,268	Inc..	6,037 0.9
Per cent. of exps.....	58.25	59.54	Dec..	1.29 2.2
St. Paul & Sioux City.....	107,299	208,549	Dec..	41,250 38.4
Net earnings.....	31,868	58,578	Dec..	26,710 83.8
Per cent. of exps.....	61.10	71.76	Dec..	9.64 15.6
St. Paul City & St. Paul.....	92,078	130,851	Dec..	38,773 42.1
Net earnings.....	9,992	21,648	Dec..	11,656 116.6
Per cent. of exps.....	89.06	83.36	Inc..	5.70 6.8
Month of May:				
Great Western, of Canada.....	\$317,400	\$341,500	Dec..	\$24,100 7.1
Net earnings.....	63,300	45,200	Inc..	18,100 28.6
Per cent. of exps.....	80.06	86.77	Dec..	6.71 7.1
Month of June:				
Central Pacific.....	\$1,391,000	\$1,046,269	Dec..	\$344,731 32.9
Cleveland, Mt. Vernon & Delaware.....	35,196	33,650	Inc..	1,546 4.6
Denver & Rio Grande.....	56,843	41,051	Inc..	15,792 38.4
St. Louis & South-eastern.....	78,818	90,184	Dec..	11,366 14.4
First week in July:				
Atchison, Topeka & Santa Fe.....	\$43,759	\$38,917	Inc..	\$4,842 12.4
Denver & Rio Grande.....	15,088			
St. Louis, Iron Mt. & Southern.....	73,700	55,327	Inc..	18,373 26.3
Week ending June 29:				
Great Western, of Canada.....	\$65,588	\$73,474	Dec..	\$7,886 12.0
Week ending June 30:				
Grand Trunk.....	\$181,461	\$181,072	Inc..	\$389 0.2

##### Texas Live Stock Rates.

At a meeting held in St. Louis last week the following rates

were adopted on stock from Texas points to St. Louis: From Fort Worth, Sherman and Denison, \$100 per car; from San Antonio, \$115 per car; from Taylor and Waco, \$105 per car; from Houston, \$107 per car; from Austin, Round Rock and stations on the Houston & Texas Central Railway north of Hearne, \$110. The general revision of the present freight classification was referred to a committee. Another meeting is to be held in Chicago, Aug. 13.

##### Grain Movement.

Receipts and shipments of grain of all kinds for the week ending July 7 are reported as follows, in bushels:

	1877.	1876.	Decrease.	P. c.
Lake ports' receipts.....	1,939,151	2,737,617	798,466	29.2
" " shipments.....	3,416,415	2,970,194	446,221	15.0
Atlantic ports' receipts.....	3,060,434	3,824,336	763,902	24.9

Of the shipments from lake ports, 23 per cent. were by rail this year, against 40% in 1876, 26% in 1875 and 42 per cent. in 1874.

Of the receipts at Atlantic ports 52.8 per cent. were at New York, 14 at Philadelphia, 10.8 at Montreal, 9.2 at Boston, and 9 per cent. at Baltimore.

##### Coal Movement.

Coal tonnages reported for the week ending July 7 are:

	1877.	1876.	Inc. or Dec.	P. c.
Anthracite.....	342,886	171,172	Inc..	171,713 100.3
Semi-bituminous.....	51,511	47,636	Inc..	3,875 8.1
Bituminous, Pennsylvania.....	33,253	29,751	Inc..	3,502 11.8

The actual tonnage passing over the Pennsylvania & New York Railroad for the seven months from Dec. 1, 1876, to June 30, 1877, was: Anthracite, 486,287; bituminous, 195,987; total, 682,274 tons. In anthracite there was an increase of 73,840 tons, or 17.9 per cent.

Coal shipments from Pictou, Nova Scotia, for the six months ending June 30 were 37,823 tons.

#### THE SCRAP HEAP.

##### Railroad Manufactures.

The Brooks Locomotive Works, at Dunkirk, N. Y., last week shipped two engines to the New York Elevated road.

The Ontario Car Works, at London, Ont., are at work on several orders for passenger and freight cars.

The Pompton Steel Works, at Pompton, N. J., were sold recently under foreclosure and bought by the mortgagee, Mr. Erastus Corning. It is said that they will be started up shortly.

The Hinkley Locomotive Works, at Boston, have just completed two heavy mogul locomotives for the Fitchburg Railroad. They have 18 by 24 in. cylinders, and are built and ornamented in accordance with the views and taste of Mr. George A. Coolidge, Superintendent of Motive Power. The same company has nearly completed two locomotives of 24 inches gauge for the Billerica & Bedford Railroad.

The Pittsburgh Manufacturing says: "The annual meeting of the stockholders of the Bethlehem Iron Co. was held at Bethlehem, Pa., June 26. The annual report showed that the profits for the year were but \$45,274.13. The report also informed the stockholders that the company have become the one-eleventh owners of the Bessemer patent for making steel, there being ten other companies interested in the patent in this country, and the one-half owners of the Lanth patent for making bar iron. The works are owned by 130 stockholders, and 28,168 shares were represented at the election."

The Vulcan Iron Works, at Chattanooga, Tenn., are at work on an order for 30-lbs. iron rails for the Marietta & North Georgia Railroad.

The Baldwin Locomotive Works are now building steam motors for street railroad service in Newark, N. J., Baltimore, Brooklyn, Galveston and Dubuque, Ia. One is also being built to go to Havana, Cuba, and an order has been received from Russia for one to run experimentally on a street road in St. Petersburg.

The New York, New Haven & Hartford shops at New Haven, Conn., have just turned out a new freight engine with 18 by 24 in. cylinders and four 5 ft. drivers. The boiler is 50 in. diameter.

The new iron building for the La Belle Steel Works of Smith, Sutton & Co., at Pittsburgh, is completed. The building is 400 by 126 feet, with substantial brick walls, the roof resting in single span on iron columns and stone piers. It was built by Wm. B. Scaife & Sons, of Pittsburgh.

The Pittsburgh Steel Casting Co. has contracted for a new building to replace the one lately burned. It will be 254 by 124 feet, with brick walls and iron truss roof, covered with corrugated iron. Wm. B. Scaife & Sons are the contractors.

The Allentown (Pa.) Iron Co. is making preparations to blow in two more stacks, which will make four out of the six furnaces in blast.

The Springfield Iron Co., at Springfield, Ill., has just put in operation the necessary rolls and other machinery for making fish-plates, bolts and nuts. For the fiscal year ending July 31 the company expects, unless some accident intervenes, that its production of rails will reach 27,000 gross tons, or 2,500 tons more than for any previous year. Since Jan. 1 the rail piles have all been reheated, with results so far very satisfactory. The mill is running full double turn with several thousand tons of rails ordered ahead and has had difficulty in keeping up with the orders. The company has lately made rails for the Union Pacific, the Colorado Central and the Grayville & Mattoon and has executed re-rolling orders for the Ohio & Mississippi, the Illinois Central, the Burlington, Cedar Rapids & Northern and other roads.

Mr. C. J. A. Dick has transferred the Phosphor-Bronze Smelting Works, at No. 2,038 Washington avenue, Philadelphia, to an association under the name of the Phosphor-Bronze Smelting Co., limited. All business will be done in that name hereafter. The officers of the company are: C. J. A. Dick, Chairman; Thomas L. Luders, Treasurer; H. C. Luders, Secretary.

The King Iron Bridge Co., of Cleveland, O., has a contract for a new iron bridge for the Lake Shore & Michigan Southern road, to replace the bridge that fell at Ashtabula. The present structure is only a temporary one.

The Ohio Bridge & Iron Co., at Lancaster, O., has contracts for nine highway bridges and its works are busily employed. The Iron Age states that the Manchester Locomotive Works, at Manchester, N. H., have purchased from the Amoskeag Manufacturing Co., of the same place, all the right, title and interest in celebrated "Amoskeag" steam fire-engine, and will hereafter build those engines.

##### The Metre Gauge in India.

The Indian Railway Service Gazette, in reviewing an official paper on the railroads of India, says:

"Regarding the break of gauge, we consider that an unlimited blunder, both as a financial, but more so as a working experiment. No further proof of this can be than that before one of the lines was fairly commenced the gauge was altered to the standard gauge. Whether 5 ft. 6 in. or 4 ft. 8 in. would have been most suitable for India, it is now too late to consider; but we believe the metre gauge to be an unmitigated blunder, especially for a flat, level country, and our present metre lines have not had much hilly country to contend with. The haulage alone on a metre line is at least 10 per cent. heavier than on a broader gauge, and under no consideration can speed be accelerated, unless greater risk is incurred; so, should a metre line get blocked, there is

very little means of clearing the line, by accelerating the speed of the trains, and we believe the day is not far distant when greater speed will be demanded in India. Another point, the safety of the metre gauge is 50 per cent. less than the broader gauge; for should an engine and train leave the rails, woe betide those who travel on the narrow gauge! This is fully acknowledged by the low maximum speed permitted on all metre lines."

##### The Northampton Bridge Bids.

The Springfield Republican gives the following as the bids for building the highway bridge over the Connecticut at Northampton, Mass., in place of one lately carried away:

	Iron.	Wood.
King Iron Bridge Co., Cleveland.....	\$28,746	25,336
Wrought Iron Bridge Co., Canton, O.....	24,928	20,064
Cincinnati Bridge Co.....	26,022	24,924
R. F. Hawkins, Springfield.....	29,388	24,924
Pennsylvania Bridge Co., Pittsburgh.....	30,096	24,924
New Brighton (Pa.) Bridge Co.....	29,974	22,274
Keystone Bridge Co.....	30,187	26,891
Massillon (O.) Bridge & Iron Co.....	27,056	27,724
Niagara Bridge Co., Buffalo.....	27,907	27,724
Leighton Bridge & Iron Works.....	33,002	25,336
A. D. Briggs & Co., Springfield.....		20,064
A. H. Wright, Greenfield, Mass.....		24,924
J. L. Hartwell & Co., Northampton.....		22,800
R. Comins, Troy, N. Y.....		23,712
Kellogg, Bridge Co., Buffalo.....	26,618	25,336
Frederick Hawks, Greenfield, Mass.....	27,968	26,978
Alfred P. Bolter, N. Y.....	33,440	25,336

The bridge is 1,216 feet long and will be erected on the old piers. The time specified in the bids varied from 60 days to five months. The contract has not yet been awarded.

#### RAILROAD LAW.

##### Ohio Railroad Legislation.

Among the laws passed by the Legislature of Ohio at its last session is one authorizing companies of the State to consolidate with companies organized in adjoining States, provided the roads or proposed roads form continuous lines and are of the same gauge. If the State line is reached at any point on a river not bridged the roads shall be considered as a continuous line in spite of the river. Such consolidation must be approved by a two-thirds vote of the stock at a meeting to be called for the purpose.

Another law gives general authority for casting the vote of stockholders by proxy.

Another authorizes authorities of incorporated cities, towns and villages to regulate the speed of trains within their limits; provided that in no case shall the speed be fixed at less than four miles an hour, and in villages of less than 2,000 inhabitants, at less than eight miles an hour. The penalty for violating such corporate ordinances shall not be over \$50 and costs.

Another law authorizes narrow-gauge companies to issue bonds for the building of branch roads, such bonds not to exceed \$6,000 per mile and not to bear more than 7 per cent. interest.

Another act authorizes the issue of preferred stock bearing not more than 8 per cent. dividends. Such stock shall not be more in amount than 50 per cent. of the authorized capital stock; shall be subject to redemption at par at any time after five years from the date of issue, and shall have no voting power until six months after default has been made in the payment of any dividend, such voting power to continue as long as the default does. Such stock shall not be issued unless the written consent of a majority of the common stock has first been obtained.

Another law provides a fine of not more than \$25 for jumping or hanging on engines or trains, unless by permission of the rules and regulations of the company.

Another act amends Section 2 of a previous act to protect the lives of passengers from casualties by fire, so as to read as follows:

"Section 2. No passenger cars on any railroad within this State shall be lighted by naphtha or any illuminating oil fluid made in part from naphtha, or wholly or in part from coal or petroleum, or other substance or material which will ignite at a temperature of less than three hundred degrees Fahrenheit. And the Commissioner of Railroads, by himself or agent, may, at any time, enter the cars running on any of the railroads within this State, and take from any or all lamps there-in samples of the oil found there, for the purpose of testing the same; and if it proves of a lower grade than is required by the provisions of this act, it shall be the duty of said Commissioner of Railroads to bring suit according to the provisions of Section 4 of the act to which this is amendatory."

Other acts amend the method of procedure in selling unclaimed freight and express packages; repeal Section 20 of the act of 1849 and Section 19 of the act of 1852 to regulate incorporated companies, and fix the number of copies of the Railroad Commissioner's report to be printed at 2,000, of which 1,000 are for the Commissioner, the rest for members of the Legislature, State officers, etc.

Reference has heretofore been made to the act to authorize the trustees of railroads built by cities of the first class to contract for the lease and completion of such roads, and the act to authorize the formation of common carrier companies. Both, though general in their terms, have direct reference to the Cincinnati Southern.

##### Mortgages and Judgment Claims.

In the case of the American Bridge Co. against Max Heidelberg and Milton Courtwright, trustees under the mortgage of the Kansas & Missouri Bridge, at Leavenworth, Kan., the United States Supreme Court recently gave its decision reversing that of the Circuit Court. The mortgage provided that, in case of a default continuing over six months, the trustees might, on request of holders of one-half of the outstanding bonds, take possession of the bridge and receive and collect all rents and claims due the company. The Supreme Court in its opinion says:

"The interest on the bonds being in default, the trustees, on Nov. 25, 1874, filed their bill, wherein, among other things, they set forth that there was in the hands of the company a certain amount of money which ought to be applied upon the mortgage, and certain claims due the company the proceeds of which ought to be applied in like manner. The bill prayed accordingly. The appellant, the American Bridge Co., held a judgment for \$15,435.88 and costs against the Kansas & Missouri Bridge Co., upon which an execution had been returned *nulla bona*. On Dec. 11, 1874, the judgment creditor filed a bill claiming priority of payment out of the money and proceeds of the claims above mentioned. It appears that there is a sufficient fund to meet the demand awaiting below the termination of this litigation. It cannot be denied that the return of the execution, the filing of the bill and the service of process gave the judgment creditor a lien upon the fund in question which must prevail unless the mortgagees have shown a paramount right to it."

"In this case, upon the default which occurred, the mortgagees had the option to take personal possession of the mortgaged premises, or to file a bill having a receiver appointed



and possession delivered to him. Until one or the other was done, the mortgage, as Lord Mansfield said, in *Chinnery* against Black, was "owner to all the world and entitled to all the profits made." The mortgage could have no retrospective effect as to previous income or earnings. The bill of the trustees does not affect the rights of the parties. It is an attempt to extend the mortgage to what it cannot be made to reach. Such a proceeding does not create any new right. It can only enforce those which exist already. The bill of the trustees is as ineffectual as if the fund were any other property, real, personal or mixed, acquired by the mortgagor *aliunde* and never within the scope of the mortgage.

The judgment of the Circuit Court is reversed. Mr. Justice Swayne delivered the opinion.

#### Title to Right of Way.

Some time since the Wabash & Erie Canal was sold to satisfy the liens of the bondholders. The claim was then made that the State (which owned the canal) held only an easement in the lands over which it passed and that, if the canal was abandoned as a line of transportation, the fee of the lands reverted to the original owners. The Indiana Supreme Court, however, has just set aside this claim and decided (one judge dissenting) that the sale included the lands and appurtenances in fee simple, and that the purchasers consequently have a full title to the same.

#### Damages by Fire from Locomotive Sparks—The Iowa Law.

A correspondent in Des Moines, Ia., writes as follows to the *Chicago Tribune* of a recent case in that State:

"In the Poweshiek County Circuit Court, W. E. Small recovered \$15,000 against the Chicago, Rock Island & Pacific Railroad Company, for the value of a mill destroyed by fire from another building, which was set on fire by sparks from a locomotive belonging to the company. The judgment was rendered under section 1,289 of the code, which provides that railroad corporations 'shall be liable for all damages by fire set out or caused by operating any such railway.'

"The company appealed to the Supreme Court, where they set up the claim that the clause of the section under which the judgment was found is void and unconstitutional, being in violation of the constitution, secs. 1 and 2, art. III., which provides that the style of every law shall be: 'Be it enacted by the General Assembly of the State of Iowa,' and that every act shall embrace but one subject, which shall be expressed in its title. The company claim that authority and laws providing for the revision and codification of the laws applied to the laws then in force, and not to new legislation, or to add new laws to those now in force. That the clause of the section in question is to every intent and purpose an independent act, relating to another matter than that expressed in the title of Chapter X. of the code. That it was not reported by the code commissioners, but inserted at some period of legislation by some dextrous management, and its passage secured, without the knowledge of members as to its intent or effect.

"If the law is sustained, it will place railroad corporations in a position where they can avoid liability only by ceasing to operate their roads; for the law makes the liability absolute, and not dependent on negligence or unavoidable accident. In fact it makes railroad companies liable for permitting an inevitable accident. A large fire in a large city started by sparks from a locomotive might bankrupt a railroad company. It is as if Mrs. O'Leary were called upon to pay for the burned city of Chicago, because her obstreperous cow kicked over a pail of milk and knocked over a burning lamp into combustibles.

"The point made by the company is of great importance in this State, because if sustained it will annul a large number of provisions of the code which were inserted in precisely the same way."

#### OLD AND NEW ROADS.

##### Allegheny, Kennerdell & Clintonville.

A company by this name has been organized to build a railroad of standard gauge from the Allegheny Valley at Scrubgrass, Pa., southwest to Clintonville, about six miles. Contracts have already been let for the grading and for a bridge over the Allegheny River at Scrubgrass, and the work is to be finished in three months. It will reach some deposits of coal and oil.

##### Bellefonte & Snow Shoe.

A proposal is under consideration to build an extension of this road from Bellefonte, Pa., southward to Lemont, about 10 miles. It is to be submitted to a meeting of the stockholders.

##### Cincinnati Southern.

The directors of the common carrier company have made a call of 50 per cent. on all subscriptions, payable in five equal installments. Some additional cars have been ordered, and the officers have been authorized to lease some cars, if found necessary. It is expected that the finished section of the road will be opened for traffic about July 25.

##### Colorado Central.

The extension from Longmont, Col., northward has been finally located and will connect with the Union Pacific at Hazard, six miles west of Cheyenne. It is said that work on this extension is to be pushed.

##### Columbus & Hooking Valley.

The directors have decided to declare the usual semi-annual dividend of 4 per cent., but to make it payable in stock. The new stock will represent the cost of the new Monday Creek and Snow Fork branches, which the company is building in the Hooking Valley iron region, and for which the net earnings have been used.

##### Cairo & St. Louis.

The tunnel at Kaolin, Ill., which has been a source of much trouble to the company, caved in recently, making a transfer of passengers and freight necessary. A large force is now employed in rebuilding it. The northern approach is being cut down, so as to shorten the tunnel about 100 feet.

##### Central, of New Jersey.

With the approval of the Chancellor, the Receiver has appointed a commission to examine and appraise the real estate owned by the company and not used for the purposes of the road. The commission consists of Rymer H. Veghte, of Somerville, N. J., Wm. W. Marsh, of Schooley's Mountain, N. J., and David Mulford, of Elizabeth, N. J. The company owns a great deal of real estate on the line, acquired in different ways and for different purposes, much of it with a view to selling again. Some of this should be valuable, but a good deal is probably worth but little at the present time.

##### Central, of Iowa.

For some time past there have appeared statements that the bondholders were not satisfied with the present management and these have culminated in a violent attack on Judge Dillon, of the United States Circuit Court, and Receiver Grinnell. It is charged that Judge Dillon appointed Mr. Grinnell from personal motives and further that he had been influenced in his decisions by his father-in-law, Hon. Hiram Price, who was said to be trying to get control of the property by buying up bonds at a low price. It is also charged that Receiver Grinnell runs the road chiefly for his own personal and political benefit, and that under his charge it has lost business and deteriorated in condition.

These charges have been explicitly denied by Judge Dillon in a published letter. He has occupied a high position on the bench and has always maintained an excellent reputation, so that such charges as have now been made should be backed by strong proof to be worthy of belief.

It is evident that the present attack has been in preparation for some time and much care has been taken to pave the way for it. The preliminary paragraphs have been published chiefly in papers circulating in New England, where many of the bonds are held. The author of the attack is reported to be Mr. Isaac M. Cate, of Boston, at one time President of the company.

##### Chicago, Olinton & Western.

A motion was made last week to set aside the order of sale granted to satisfy the Receiver's certificates, but, after hearing argument the Court overruled the motion. By agreement between the parties in interest the sale will not take place until August.

##### Coney Island & East River.

This company and the Coney Island, Park & Concourse Company, both organized to build roads on nearly the same line, have concluded an agreement of consolidation. The road to be built by the Consolidated Company is from Atlantic avenue in Brooklyn to Coney Island, skirting Prospect Park. It is to be of standard gauge and will be built below the level of the streets in the built-up portion of Brooklyn, the streets being carried over it on bridges. It is said that the company has completed all its arrangements for building the road and that work will be begun very soon.

##### Caldwell.

It is proposed to organize a company to build a railroad from Caldwell, N. J., east to Montclair, about four miles, and committees are canvassing for subscriptions. The intention is to acquire and use the road-bed partly graded by the Montclair several years ago, but it is not decided whether connection will be made with the Montclair & Greenwood Lake or the Delaware, Lackawanna & Western branch at Montclair.

##### Covington, Columbus & Black Hills.

General Superintendent Meckling, after writing of the reorganization of the company, which has already been noted, says: "We are now completing 1½ miles of grade per day, and expect to add to our present line 140 miles of completed road by Jan. 1, 1878."

##### Chicago & Lake Huron.

The Chicago *Inter-Ocean* says that this company and the Grand Trunk have completed arrangements for their joint passenger business and that a through train to run between Chicago and Portland, Me., over the two roads will be put on about Aug. 1. This train will probably also make a close connection for Boston.

##### Central Pacific.

The earnings now show a considerable falling off from last year, due doubtless to the partial failure of the wheat and other crops in California. The unusually dry spring has caused a great deficiency in the wheat crops, especially in the San Joaquin Valley and the traffic from that region will be light for some time to come.

The company has followed the example of some Eastern lines and ordered a reduction of 10 per cent. in all salaries and wages. This reduction dates from July 1, and is general, without exceptions.

The depot of the Oregon Division at Marysville, Cal., was destroyed by fire July 16, with 17 cars and a large quantity of freight, the loss being estimated at \$50,000. The fire is thought to have been purposely started, but no one has been arrested.

##### California Pacific.

San Francisco dispatches state that the bankruptcy proceedings begun by some of the German bondholders have been finally withdrawn.

##### Chicago & Southern.

The Receiver has applied to the Superior Court in Chicago to have \$320,000 bonds issued by the company declared void, and also for an order to compel certain parties in Chicago to deliver up some of the bonds which they now hold. The grounds alleged for the application are that the issue of bonds was never authorized by the stockholders, but was made by the directors on their own motion, and that no consideration was received for any of them except for \$100,000 (face value), which were sold to H. F. Eames for \$45,000. It is said that most of them were used to take up notes issued by the Chicago, Danville & Vincennes Company.

##### Dividends.

Dividends have been declared as follows:

Panama, 3 per cent., quarterly, payable Aug. 1.  
Nauvutuck, 5 per cent., semi-annual, payable July 16.  
Columbus & Hooking Valley, 4 per cent., semi-annual, payable in stock.  
Louisville & Nashville, 1½ per cent.  
Illinois Central, 2 per cent., semi-annual, payable Sept. 1.

##### Delaware & Hudson Canal.

The board of directors held a meeting in New York, July 18, at which it is said that the question of executing a new mortgage for \$10,000,000 on the company's property was considered. The board adjourned, however, without taking any action in the matter.

##### Detroit, Lansing & Northern.

This company has offered to extend its Stanton Branch from Stanton, Mich., north to Cedar Lake, in Montcalm County, about nine miles, provided the people on the line will grade and tie the road. If the proposition is accepted and the road built, the Detroit, Lansing & Northern will run its trains through to St. Louis, making that the terminus of the branch. This will be done by using the track of the Chicago, Saginaw & Canada, which is laid from Cedar Lake to St. Louis, about 20 miles.

##### Duxbury & Cohasset.

The Massachusetts Railroad Commission has concluded its investigation of the affairs of this company. The Boston *Advertiser* says: "The report will not be made public unless at the request of one or more of the parties in interest. It is understood, however, that the Commissioners comment at length upon the manner in which the contract for building the road was carried out, and express the opinion that if the towns owning stock had equipped and operated the road, it could have been run at a profit. In conclusion, the Commissioners recommend that the interest of the several towns owning stock in the road be purchased by the Old Colony Company, and that referees be appointed to appraise the value of the same, offering to become referees, if their services should be desired."

##### Des Moines & Minnesota.

This company is now trying to secure town and individual subscriptions along the line for an extension of its road from Ames, Ia., northward into Minnesota.

##### European & North American.

The New Brunswick Court having authorized the Receivers of the eastern section of the line to make the necessary expenditure for changing the gauge from 5 ft. 6 in. to 4 ft. 8½ in., a conference was held in Bangor, Me., July 16, between the Receivers and the Trustees who have possession of the Maine end

of the road. It was then decided to make the change as soon as the necessary preparations can be completed.

##### Gilman, Olinton & Springfield.

The Illinois Central Company having acquired possession of this road, a formal organization of a new company has been made and the necessary certificates have been filed with the Secretary of State of Illinois. The new company is known as the Chicago & Springfield Railroad Company, and its incorporators are all officers or stockholders of the Illinois Central.

##### Hoosac Tunnel Line.

The contract for building the portal at the east end of the Hoosac Tunnel and for the arching and other masonry of the little tunnel at North Adams has been let to C. McClallan & Sons. This is the last of the tunnel contracts.

##### Illinois Tax Cases.

A dispatch from Springfield, Ill., dated July 14, says: "In the United States Court to-day Judge Drummond delivered his decision as to the railroad tax cases. He admits that the receivers of the railroads in the hands of this court pay the taxes within 90 days from the date of the order, after which time the county collectors have permission to proceed against the property of the roads if the payment is not made. The order, however, especially excepts cases where the road has passed into the hands of third parties since the taxes of 1873 became due, and also when the road in the hands of the receiver has been formed by the consolidation of two or more roads situated in different States. The Springfield & Illinois Southeastern Railroad comes under the former, and the Ohio & Mississippi under the latter. In these cases the receivers are permitted to go into the State courts and resist payment, with a view of settling the question of liability. A fourth exception is made as to cases where the collector's warrant was not attached to the railroad tax books, the court holding that the neglect of the proper officers to affix the warrant to the book was fatal to the enforcement of the collection. Several counties interested have been guilty of such neglect. The warrant was affixed to the general book, but not to the separate book in which railroad property is listed."

##### Lodi.

Application has been made to the Vice-Chancellor of New Jersey by a creditor for the appointment of a receiver for this road. The road is about one mile long, from the New Jersey & New York near Hackensack, N. J., to Lodi. It was built chiefly to accommodate the large print works at Lodi, but they have not been at work regularly for some time past and have given the road but little business.

##### Louisville & Nashville.

At a meeting of the board in Louisville, July 11, it was reported that the surplus profits for the year ending June 30 were about \$350,000, after paying all interest and rentals. The board resolved to appropriate \$135,000 for the payment of a dividend of 1½ per cent. on the stock, and to apply the remainder to the reduction of the debt.

The company paid 8 per cent. regularly for several years and 7 per cent. for a time, but has declared no dividend since February, 1873, except the present one.

##### Marietta, Pittsburgh & Cleveland.

The following circular is issued: "This company's road having been sold on the 13th inst. to Cyrus W. Field, John Paton and Isaac Morton, Trustees for bondholders, who have appointed S. C. Baldwin Manager, reports of ticket sales and car mileage accruing to this road after June 30 should be reported to S. C. Baldwin, Manager, Marietta, O."

A report is current that the purchasers are negotiating with the Cleveland, Tuscarawas Valley & Wheeling for a consolidation of the two roads, which connect at Canal Dover.

##### Missouri, Kansas & Texas.

A dispatch dated July 15 says: "The Choctaw and Chickasaw Indian Nations have brought suit against the Missouri, Kansas & Texas Railroad on a claim for \$70,000 for ties, timber, masonry, coal, etc., used in the construction of that road. The examination took place at Muskogee in the Creek Nation, before Major Marston, Indian Agent of six consolidated tribes, and was concluded on Thursday. The railroad company produced receipts for money paid for ties and other material to individuals, but the plaintiffs claim that the property belongs to the Nations in common and not to individuals, who have no right to dispose of it in any way. The examination was made under the law which requires that all disputes between Indians and whites shall be investigated by a United States Indian Agent and a report made to the Interior Department. Some of the testimony offered was ruled out under instructions from the Department. The stenographic reporter of the testimony has arrived here and will write out his notes and forward the report to Washington."

##### Memphis & Little Rock.

On petition of the trustees, the United States Circuit Court has enjoined a sale of the depot property and track in Memphis, Tenn., which was ordered by the Tennessee Court, until the rights of the bondholders in the property can be passed upon by the United States Court.

##### Meadville & Girard.

A preliminary survey has been made for a narrow-gauge road from Meadville, Pa., to Girard, about 32 miles. The route surveyed is from Girard by the old canal bed to Cranestown, thence up Conneaut Creek and by way of Wellsburg and down the Cussewago Creek to Meadville. The estimated cost is \$250,000, and it is said that subscriptions to the amount of \$50,000 have been offered.

##### Milwaukee, Lake Shore & Western.

A preliminary survey is being made for an extension of this road from New London, Wis., northward to Shawano, about 30 miles.

##### New Jersey Southern.

An appeal having been taken from the Chancellor's decision in the foreclosure suit, the Committee of Reorganization requests bondholders to grant an extension of its powers, as the present agreement, under which the committee now acts, will expire Aug. 1, 1877.

##### North Carolina.

At the annual meeting in Salisbury, N. C., July 12, a resolution was passed instructing the board of directors to examine the bonds deposited by the Richmond & Danville Company as security for its performance of the contract of lease, and to report by circular to the stockholders, giving the present value of the bonds, with a list of the same. Should the bonds deposited be deemed insufficient, the directors are instructed further to require the lessee to make up the deficiency.

Another resolution requires the Treasurer to prepare a detailed statement of the affairs of the company, to be ready at least five days before the annual meeting.

A third resolution approves the action of the lessee in putting on the fast mail train, which is now run over the road.

##### Ohio Central.

The Court of Common Pleas at Bucyrus, O., has appointed A. W. Scott, of New Lexington, O., Receiver of this road. The road was originally the Atlantic & Lake Erie, the present name having been adopted about a year ago. It is in operation from Moxahala, O., to New Lexington, 8 miles, and from Bremen to



a junction with the Pittsburgh, Cincinnati & St. Louis near Newark, 28 miles, the two sections being connected by the use of the Cincinnati & Muskingum Valley track from New Lexington to Bremen, 12 miles. Some additional road is graded. The road was built to develop some coal and iron properties and is still unfinished.

#### Ohio & Mississippi.

The following order has been issued by Receiver King: "The continued great depression in business and consequent enormous decrease in receipts, especially since May 1, makes it necessary to reduce expenses."

"Notice is therefore given that on and after July 16 a general reduction of 10 per cent. on the wages of all officers and employees will be made."

"This order does not apply to employees who are now paid at the rate of one dollar per day or less."

#### Olympia.

A company, known as the Thurston County Construction Company, has been organized to build this road, which is to run from Olympia, Wash. Ter., to Tenino, about 15 miles. The company will receive a subsidy of \$75,000 in county bonds, voted three years ago. It has already purchased the right of way and what grading has been done from the old construction company.

#### Pittsburgh & Castle Shannon.

Work is very soon to be begun on the extension of this road from Castle Shannon, Pa., to Washington. There were 35 bids received for the construction of the 14 miles from Castle Shannon to Finleyville, varying from \$65,000 to \$115,000. The contract has not yet been awarded. Proposals will be called for before long for the 16 miles from Finleyville to Washington.

A survey has been made for a branch from Finleyville to Monongahela City, five miles.

#### Philadelphia & Atlantic City.

The gauge of this new road is 3 ft. 6 in., and not 2 ft. 6 in., as we were made to say by a typographical error last week.

An excursion train went over the road at the appointed time last week and the formal opening took place, but trains are not running regularly yet, as there is still some ballasting and finishing up to be done. It is probable that regular trains will run next week.

#### Rhode Island & Massachusetts.

Mr. Wm. G. Smith, Resident Engineer, writes under date of July 16: "We have just finished laying the rails on this road, 14 miles, from Franklin, Mass., southward to Valley Falls, R. I."

The road is of some local importance, serving several manufacturing villages. It could also be made part of a line from Boston to Providence by using the New York & New England from Boston to Franklin and the Providence & Worcester from Valley Falls to Providence. This line would be 47 miles long, three miles more than the Boston & Providence.

#### St. Louis, Iron Mountain & Southern.

This company has given notice that it will not hereafter receive or recognize tickets sold or baggage checked to points on its line southwest of Little Rock by the Memphis & Little Rock road or any route passing over that road. The reasons given are the refusal of the Memphis & Little Rock to advance rates in accordance with the recent action of Eastern lines, and the fixing, by that company, of rates from Little Rock at an unreasonably low point.

On the other hand the Memphis & Little Rock charges that the Iron Mountain has persistently refused to make any fair arrangement with it for Texas business, its apparent object being to force all that business to St. Louis, and that it has cut down its rates to Little Rock for the purpose of enforcing some equitable agreement on through business. The company, it is understood, has the support of the Louisville & Nashville in its present course.

The immediate result of this difference is a reduction of fares to Little Rock. Drawback tickets from Louisville to Little Rock (512 miles) are now sold for \$10.

#### Seattle & Walla Walla.

Contracts for the extension of this road from Renton, Wash. Ter., to the Newcastle coal mine, 6½ miles, have been let as follows: Grading, to L. D. Frank; clearing, to Harmon & Walker; bridging to Knox & Eustis and Jacob Derr.

The equipment of the road now consists of 2 engines, 1 passenger car, 1 caboose, 5 flat and 16 coal cars; 24 more coal cars, to carry nine tons each, are being built in the company's shops at Seattle.

#### St. Louis, Kansas & Colorado.

The committee appointed by the convention lately held in St. Louis in aid of this projected road has issued an address, which contains statistics comparing the cost of construction and operating of narrow and broad-gauge roads, and recommends that St. Louis put an engineer corps in the field at once to survey one or more routes to the western border of the State. Three millions is the sum stated as the cost of 300 miles of road. Of this amount St. Louis is to subscribe \$1,000,000 and the people on the route agreed upon \$1,000,000, to be paid in cash or material and work at cash prices, such subscribers to have the option of receiving stock or transportation certificates, redeemable in five equal annual payments, without interest. The other \$1,000,000 is to be raised by the sale of bonds which the committee believe can be sold at par.

#### Suffolk & Albemarle.

A company by this name has been organized to build a railroad from Suffolk, Va., the crossing of the Seaboard & Roanoke and Atlantic, Mississippi & Ohio roads, southward to Edenton, N. C., on Albemarle Sound. The distance is about 45 miles, over a level country.

#### Syracuse, Geneva & Corning.

It is proposed to build a branch from Dresden, N. Y., to Penn Yan, about four miles. The people of Penn Yan propose to raise the money needed, if the company will equip and work the branch when the main line is completed.

#### Springfield & Northwestern.

An effort is being made to secure the extension of this road from its present terminus at Havana, Ill., northwest 10 miles to Lewiston. This will require the completion of the bridge over the Illinois River at Havana, which was begun by the Indianapolis, Bloomington & Western several years ago, at the time its Western Extension was built to Havana. It is thought that some arrangement for completing this bridge can be made with the Receiver.

#### Utah Northern.

This company is trying to secure some local subsidy for an extension of its road from the present terminus at Franklin, Idaho, to Cottonwood, about 25 miles. It is promised that if the extension is made the bulk of the Idaho and Montana freight coming over the Union Pacific will be sent to Cottonwood, for transfer to teams at that point.

#### West Wisconsin.

The holders of the mortgage bonds are notified that, by order of the Circuit Court of the United States, the Receiver will issue receiver's certificates to the amount of \$200,000, payable on or before the expiration of one year from their date, bearing interest at not exceeding 8 per cent. per annum, the money to be raised upon these certificates to be used in re-

building the Black River Bridge and putting down steel rails; the certificates, by order of the court, to be first lien upon all the property and franchises of said railway company. Each holder of the mortgage bonds of said company will, for 30 days from the date of this notice, be entitled to purchase at par such proportion of said certificates as the bonds held by him bear to the whole number of bonds outstanding. After that time any holder of said bonds will be entitled to purchase at par certificates then remaining unsold.

#### Western & Atlantic.

This company has completed an arrangement by which sleeping cars are run through between Philadelphia and New Orleans, by way of Washington, Lynchburg, Knoxville and Atlanta. This through train runs from New York to New Orleans in 63 hours; it connects at Columbus, Ga., with the fast train over the Coast Line, and by way of Augusta and Macon.

### ANNUAL REPORTS.

#### Marietta & Cincinnati.

This company works the following lines:

	Miles.
Main Line, Cincinnati to Belpre.....	203
Baltimore Short Line, Warren's to Belpre.....	80
Hillsboro Branch, Blanchester to Hillsboro.....	21
Marietta Branch, Scott's Landing to Marietta.....	4
Scioto & Hocking Valley Branch, Hamden to Portsmouth.....	56
Total.....	314

The Baltimore Short Line is used as a part of the Main Line. Included in the Main Line is the Cincinnati & Baltimore road, 5.6 miles, which forms the entrance of the road into Cincinnati. Both these lines have separate organizations, but are really owned by the company. The only report published for the year ending Dec. 31, 1876, is that of the President, Mr. John King, Jr. Lately the road has been put in the hands of a receiver, on application of the trustees under the fourth mortgage, the bonds issued under that mortgage being all, or nearly all, held by the Baltimore & Ohio Company.

The passengers and freight moved were:

	1876.	1875.	Inc. or Dec.	P. c.
Passengers carried.....	676,941	684,469	Dec.	7.528
Tons freight moved.....	800,000	656,120	Inc.	143.880

There was an increase of 17,817 through and a decrease of 25,345 local passengers, the through increase being mainly in Centennial passengers carried at low rates. The local decrease resulted partly from the fact that there was no Exposition at Cincinnati last year.

The equipment consists of 73 engines; 27 passenger and 18 mail and baggage cars; 1,479 freight cars.

There were laid during the year 1,170 tons of new rails and 81,438 ties; seven new bridges were built, two of them to replace the Spring Grove bridges in Cincinnati, thrown down by accident.

The earnings for the year were:

	1876.	1875.	Inc. or Dec.	P. c.
Passengers.....	\$478,972 02	\$473,692 22	Inc.	\$5,279 80
Freight.....	1,020,424 97	1,029,941 93	Dec.	9,516 96
Express, mail, etc.	137,655 29	158,381 14	Dec.	20,725 85
Total.....	\$1,637,052 28	\$1,662,015 29	Dec.	\$24,963 01
Expenses.....	1,291,870 54	1,290,590 50	Inc.	1,280 04

	1876.	1875.	Inc. or Dec.	P. c.
Net earnings.....	\$345,181 74	\$371,424 79	Dec.	\$26,243 05
Gross earn. per mile.....	5,213 54	5,293 00	Dec.	79 46
Net.....	1,099 30	1,183 00	Dec.	89 70
Per cent. of expenses.....	78.91	77.65	Inc.	1.26

The net earnings were less than half the amount required to pay interest on the funded debt. The President's report says:

"All the expenditures upon the road have been charged to repairs, and the construction account closed. Very considerable sums have been in this, as in former years, charged to repairs, which might properly be regarded as construction, but it has been deemed advisable to charge the whole amount to repairs, although a slight increase in the ratio of working expenses is shown. \$692,350 of the stock of the Cincinnati & Baltimore Railway Company, \$1,991,700 of the stock of the Baltimore Short-Line Railway Company and \$750,000 of the bonds of the Baltimore Short-Line Railway Company were sold at par and accrued interest, and \$1,996,000 of the fourth-mortgage bonds of the Marietta & Cincinnati Company were sold at 75 and accrued interest, making a reduction in the floating debt of \$4,183,770.84."

"Statements have been made from time to time in the annual reports of the regular and rapid decrease in the rates of through freight. In order that this may be more fully understood, the following table and remarks are presented:

Year.	Tons.	Revenue.	Average per ton.
1868.....	67,462	\$196,686 01	\$2 90
1869.....	100,447	283,174 80	2 82
1870.....	120,024	284,593 79	2 37
1871.....	183,341	358,845 06	2 18
1872.....	292,897	604,640 42	2 06
1873.....	386,302	748,553 38	1 93
1874.....	399,577	626,563 09	1 56
1875.....	291,539	390,679 30	1 34
1876.....	432,376	491,608 78	1 14

"It will be seen that in 1876 the quantity of east-bound through freight was twelve times as great as in 1868, and the revenue only about four times as great as the rate between Cincinnati and Parkersburg decreased year after year from \$3.17 per ton in 1868 to \$2.38 in 1869, to \$2.08 in 1871, to \$1.64 in 1874, and finally to \$1.14 per ton in 1876. In like manner the rates of west-bound freight, which in 1868 were \$2.70 per ton, in 1871 were \$2.18; in 1873, \$1.64; in 1875, \$1.42, until in 1876 they reached the very low price of \$1.19 per ton."

"It will be observed that the total through business, which in 1868 was but 67,462 tons, with a revenue of \$196,686.01, or \$2.90 per ton, reached in 1876 the enormous quantity of 432,376 tons, while the revenue was \$491,608.78, or only \$1.14 per ton. Had the rate for 1868 governed in 1876 the revenue from through traffic, instead of being \$491,608.78, would have been \$1,153,890.40, or \$662,281.64 more than in 1868! When it is remembered that the amount of interest of the first, second and third-mortgage bonds, in the aggregate, is \$660,000, the vast importance of this statement will be understood. Special reference is made to 1868 for the reason that at that time a series of improvements were commenced, upon the completion of which it was expected to have the road in such condition as to command a large share of the through traffic, which was regarded as very desirable, and which was then transported by rival routes."

After stating the necessity for the improvements made since 1868, including the construction of the Cincinnati & Baltimore and the Baltimore Short Line roads, and referring to the war of last year between the trunk lines and its causes, the President says:

"The Marietta & Cincinnati road carried of east-bound through traffic about double the quantity transported in 1875. By the adoption of the most careful and rigid system of economy the largely increased business of the year was performed at about the same expense as for the previous year."

"To prevent repetitions of contests so needless, so useless, so injurious to all the vast interests involved; to avoid monopolies always and deservedly unpopular and at the same time maintain a healthy competition between the different trunk

lines and the cities of the seaboard which are the great entrepôts of the nation's commerce, are the problems which must be solved in order to save the railroad property of the country from its present great peril. It is a subject for careful consideration whether the system adopted by the principal railways in England after years of similar contests, by which they were brought to the verge of ruin, or the modification of that system which has been in successful operation for a long period by the lines leading West from Chicago, or some better arrangement embracing the most desirable features of both, can not be perfected for the government of the principal roads in the United States."

"During the year harmonious relations have been maintained with all connecting lines. The Cincinnati Southern road will be opened for business in 1877, and it is expected that a very large trade will by this new and important channel be brought to Cincinnati, and a fair share of the through business will be sent over the Marietta & Cincinnati road, as affording its shortest and most economical communication with the seaboard. Negotiations have been in progress to establish, in connection with the Cincinnati Southern road and the other lines leading into the city, a Union Depot upon the grounds of the Marietta & Cincinnati Company, which afford the most convenient and desirable location for such a purpose in Cincinnati. This, it is hoped, will be consummated, as it is believed it will be best for the general interests of the city of Cincinnati, and in addition that the freight depot of the Southern road will be built in the same locality. The board tenders to the officers and employees of the company thanks for efficient services during the year."

#### St. Louis, Alton & Terre Haute.

This company owns a line from Terre Haute, Ind., to East St. Louis, Ill., 191 miles; a branch from Alton Junction to Alton, 4 miles, and a branch from East St. Louis to Belleville, 15 miles, 210 miles in all, and it leases the Belleville & Southern Illinois road, from Belleville to Duquoin, 56 miles. The Main Line and Alton Branch are leased to the Indianapolis & St. Louis Company, so that the line worked by the company is that from East St. Louis to Duquoin, 71 miles. The report is for the year ending Dec. 31, 1876.

The general balance sheet is as follows:

Stock (\$22.707 per mile).....	\$4,768,400 00
Bonds (\$33.333 per mile).....	7,000,000 00
Interest and rentals accrued.....	173,368 11
Trusts sinking fund.....	12,500 00
Coupons.....	11,429 77
Income account.....	57,894 59

Total (\$87.255 per mile).....	\$12,023,592 47
Stock account.....	11,768,400 00
Bills, accounts and balances receivable.....	255,192 47
Total.....	\$12,023,592 47

The trustees of the sinking fund hold \$535,500 bonds, the funds for the purchase of which have been derived, \$387,500 from regular payments of \$25,000 per year and \$200,788.66 from accumulation of interest.

The earnings of the 195 miles leased, as reported by the lessee, were:

	1876.	1875.	Inc. or Dec.	P. c.
Gross earnings.....	\$1,072,503 40	\$1,019,837 81	Inc.	\$52,665 59
Expenses.....	804,744 63	824,165 64	Inc.	38,578 99
Net earnings.....	\$267,758 77	\$195,672 17	Inc.	\$72,086 60
Minimum rental.....	450,000 00	450,000 00		
Loss to lessee.....	\$240,241 23	\$254,327 83	Dec.	\$14,086 60
Gross earn. per mile.....	5,500 02	5,229 94	Inc.	270 08
Net earn. per mile.....	1,076 56	1,003 45	Inc.	73 11
Per cent. of exps.....	80.44	80.81	Dec.	0.37

The proportion of expenses to earnings continues high, chiefly on account of the very low rates received on a large part of the traffic.

On the 71 miles operated the work done was:

Passenger cars carried.....	165,484
Passenger mileage.....	3,582,278
Average rate per passenger per mile.....	21.3 cts.
Tons general freight carried.....	113,108
Tonnage mileage.....	4,924,867
Average rate per ton per mile.....	3.04 cts.
Tons coal carried.....	392,305
Average rate per ton per mile.....	2.63 cts.

The coal traffic from the Belleville Branch showed a considerable decrease owing to the partial exhaustion of mines; to reach new openings several short spurs must be built. There was an increase in coal from the leased line. The freight exchanged with the Illinois Central at Duquoin was 73,576 tons, of which 32,286 tons were through freight between St. Louis and Cairo.

The earnings of this 71 miles were:

	1876.	1875.	Inc. or Dec.	P. c.
Coal.....	\$215,562 43	\$233,218 07	Dec.	\$17,656 64
Freight.....	149,991 53	198,517 65	Dec.	48,526 02
Passengers.....	112,143 27	115,368 82	Dec.	3,225 55
Express, mail, etc.	21,945 57	14,274 74	Inc.	6,770 83
Total.....	\$499,742 80	\$561,899 18	Dec.	\$62,156 38
Working expenses.....	370,188 84	332,679 93	Dec.	37,508 91
Construction and equipment.....	4,003 33	13,792 69	Dec.	9,789 36
Total.....	\$274,192 17	\$346,472 62	Dec.	\$72,280 45

	1876.	1875.	Inc. or Dec.	P. c.
Net earnings.....	\$224,550 63	\$215,396 56	Inc.	\$9,154 09
Gross earnings per mile.....	7,024 55	7,913 65	Dec.	889 10
Net earn. per mile.....	3,192 97	3,003 75	Inc.	189 22
Per cent. working expenses.....	54.17	59.21	Dec.	5.04
Per cent. all exps.....	54.98	61.66	Dec.	6.68

Of the gross earnings the Belleville Branch contributed \$252,068.89, or \$16,804.59 per mile; the Belleville & Southern Illinois \$246,673.91, or \$4,404.89 per mile. The net profit from the leased line, after paying rental, was \$12,415.54; net earnings of the branch on business derived from the leased line were \$46,565.94.

The general result of the year was as follows:

Minimum rental, Main Line.....	\$450,000 00
Net earnings of line worked.....	224,550 63
Interest.....	7,254 11
Total.....	\$681,804 74
Rental, Belleville & So. Ill. RR.....	\$95,264 20
Interest on funded debt.....	499,000 00
Sinking fund.....	25,000 00
Real estate and right of way.....	6,500 00
Main Line expenses, leg. l. etc.....	10,544 37
Capital stock tax for 1873, 1874 and 1875.....	16,374 70
Total.....	652,683 27

Surplus for the year.....\$229,121 47

The business of the through line to Cairo suffered from the suspension of transfers at Cairo for a time when the transfer was out of repair, and from the difficulties of the line south from Cairo; also from the fact that the river was open to St. Louis nearly the whole year. The coal trade suffered from the destruction of the dump at East St. Louis by fresher, losing for a time the river trade.

There was put in the track 401 tons steel and 145 tons new iron rails and 23,000 ties; 40 coal cars were rebuilt. Road and equipment are generally in good condition.